CHEMICAL MARKETS

VOLUME XXIV ESTABLISHED 1914 NUMBER 4

Contents for April, 1929

CHEMICAL MARKETS, INC., Publishers
Publication Office, 28 Renne Ave., Pittsfield, Mass. Editorial and General Office, 25 Spruce St. New York City
WILLIAMS HAYNES, PRESIDENT; ROBERT STRANGE, SECRETARY; D. O. HAYNES, JR., TREASURER

PUBLISHED ON THE TENTH DAY OF EACH MONTH AT PITTSFIELD, MASS. SUBSCRIPTION TWO DOLLARS A YEAR, IN ADVANCE, POSTPAID TO ALL COUNTRIES; SINGLE COPIES, CURRENT ISSUE, 25 CENTS; BACK COPIES, 50 CENTS EACH. NOTICE OF THREE WEEKS IS NECESSARY TO CHANGE SUBSCRIBER'S ADDRESS AND IN WRITING PLEASE GIVE BOTH THE OLD AND NEW ADDRESSES. PRINTED FOR THE PUBLISHERS BY THE SUN PRINTING COMPANY, PITTSFIELD, MASS. ENTERED AS SECOND CLASS MATTER, JANUARY 1, 1928 AT THE POST OFFICE AT PITTSFIELD, MASS., UNDER THE ACT OF MARCH 3, 1879.

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VOL. XXIV. APRIL, 1929 No. 4.

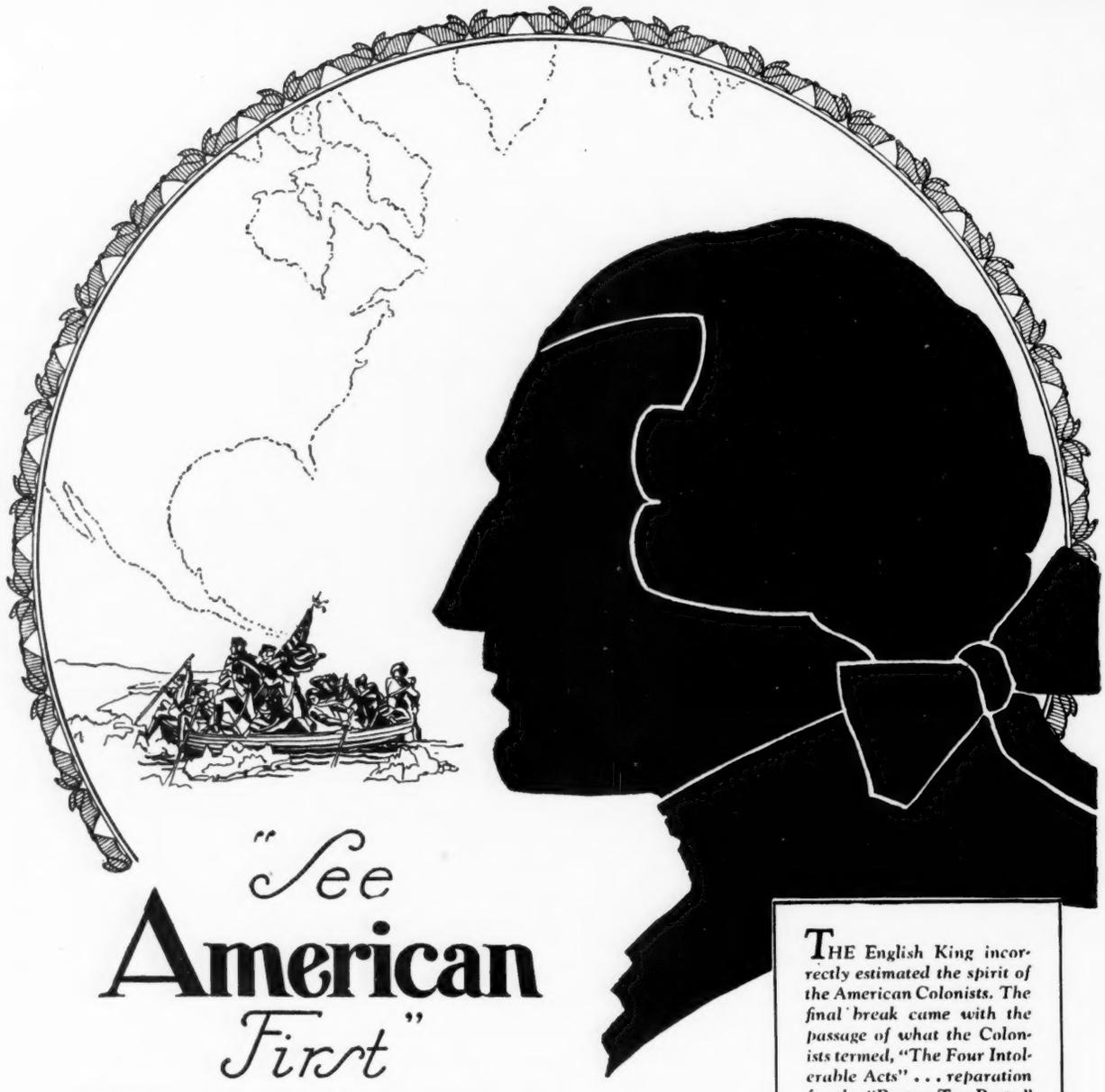
Land vs. Laboratory

SOME super-enthusiastic chemical dreamers have been widely depicting the American chemical industry as a sort of glorified incinerator into which the American farmer might dump any kind of agricultural waste or surplus and from which clever American chemists would draw forth a variety of valuable, marketable products ranging from dyes and motor fuel to baby food and cigarette holders. We have in the past criticized the careless thinking which has prompted these well-meant efforts to propagandize the importance of chemistry as an industrial wonder worker. More than once we have pointed out that such glib promises might some day be embarrassing to the industry and bitterly disappointing to the farmers.

SOME keen-eyed farm tariff proposers have just sufficient mathematics to figure out that our alcohol production would very neatly consume our surplus production of corn, provided that the import of by-product molasses from Cuba might be stopped by a wall of prohibitory duty. A mere doubling of raw material costs or a geographical switch from seaboard to corn belt means nothing, so they argue, to so versatile and prosperous an industry as this magic making chemical group. We can hardly blame them for omitting any serious consideration of the economics of such a situation when the chemical soothsayers, whom they have naturally mistaken as spokesmen of the industry, have been equally neglectful.

IF this preposterous proposal to tax a waste by-product out of the class of available industrial raw materials in order to create an industrial market for a good foodstuff means anything at all it means that economics governs both chemistry and agriculture, a fact which both chemists and farmers are apparently prone to forget. The chemist who chatters promises which the industry is not able economically to fulfill is preforming a dis-service in that he encourages an alchemical view of chemical enterprises at a very time when a more thorough appreciation of the plain fact that this industry is basically a business proposition is sorely needed. A farmer who attempts to make artificial markets for farm products defies the laws of economics, and should, in this molasses case, be reminded sharply of the story of vanilla beans and gum camphor.

LAND and laboratory should be allies not rivals. But their 'alliance will only be successful upon the basis of a mutual comprehension of the economics involved in their co-operation.



"See American First"

IT is good market strategy to fill your Alcohol requirements with "American" Brand.

The reasons are apparent when you test this Alcohol "under fire"—that is, in actual manufacturing processes. Then American Alcohol stands up convincingly.

Back of this always-present quality are exacting standards of manufacture, and an exclusive distillation process, originated in our laboratories.

American Alcohol comes to you in unvarying uniformity, ready to contribute its quota of quality to your product.

When in need of Alcohol it will pay you to "See American First."

THE English King incorrectly estimated the spirit of the American Colonists. The final break came with the passage of what the Colonists termed, "The Four Intolerable Acts" . . . reparation for the "Boston Tea Party," and submission to England; transfer of governmental powers to the English military commander; the Transportation and the Quebec Acts. Fortunately for America, the wise and strong Washington led the often ragged and hungry Continental armies . . . and to ultimate success.

This is number 4 of a series depicting historical periods in the development of America

"SEE AMERICAN FIRST"

COMMERCIAL ALCOHOL CORPORATION

420 Lexington Avenue, New York, N. Y.

Plants:

Pekin, Ill. Philadelphia, Pa. Gretna, La.

AMERICAN DENATURED ALCOHOL

The High Cost of Records

Mr. Seaverns' entertaining reminiscences of the mid-Victorian chemical trade of Boston would hardly seem at first glance to point a moral. He tells of chemical business conducted under so different conditions that it appears to be quite a different world. Silk hats and letter-presses, no typewriters and few telephones, a single salesman to cover all of New England, 7 a. m. to 6 p. m. office hours—it seems fairly antediluvian, clumsy and slow. It is quite easy to fall into the pose of the pharisee and to thank God we are not as they were. But our boasts of our modern efficiency are checked short by his devastating criticism that business was in those good old days both more simple and more profitable than now.

That is a damning indictment. "More simple" means that it was more efficient. "More profitable" means that it achieved the chief end of business activity better than we do.

Mr. Seaverns attributes these sterling excellencies to the fact that our grandfathers were content with records that consisted chiefly of a letter file and a ledger. We were inclined to set him down as one of those executives who so cordially detest "red tape" that he is quite willing to sacrifice systematic routine to the dread of being enmeshed in paper work. We even suspect him of sighing a little too wistfully over the good old days, until we read an editorial on this very subject in the February 21st issue of "Printer's Ink."

In this it was set forth that one company had discovered that the cost of merely recording the dates of salesmen's calls was $400 a year and that some items in their elaborate sales records cost as much as $1500 a year. A further analysis showed that each dollar so spent could only be offset by the sale of $25 additional business, and measured by this yardstick a great deal of record-keeping was eliminated as definitely unprofitable.

A similar, sane analysis of any chemical company's records could hardly but fail to come to identical conclusions and to confirm Mr. Seaverns' statement. Such simplification as this, is worth investigating.

Fire Preferred

So much has been said about the necessity for research in industry that it is almost safe to assert that research has been "sold". Research laboratories, regarded only a few years ago by most business executives as expensive luxuries, are becoming so vital to successful operation that they have an important influence on corporate credit. In proof whereof we offer the following story.

A certain company in excellent financial condition was seeking credit for the first time. The directors of the bank to which it had applied were discussing the company's condition. It had engaged successfully in the same line of business for fifty years. The equity behind the common stock amounted to about $20,000,000, all of which had been built up out of surplus. The original capital was represented by preferred stock and net earnings on the common had averaged about $2,000,000 a year for the past three years. The company owed no money, manufactured its own products, marketed them in its chain of stores and controlled leading companies producing allied lines. Yet the head of the bank's underwriting subsidiary objected to the proposed financing on the ground that the company did not have its own research department. The objector said that he had learned that it was possible for one or two fundamental changes to develop that might wipe out that particular company in less than two years. "Research", the banker was quoted as saying, "is the only insurance I know of that can protect this particular business from a hazard far more disastrous—if it occurred—than fire".

In the chemical industry, where obsolescence constantly casts its ominous shadow over plants, equipment, and processes, those companies which were not born with research have since either acquired it or had it thrust upon them. It has been necessary for survival and to-day it is safe to say that production is determined far in advance by the reaction in the test-tube. But economic research has not been entered into with the same completeness and thoroughness. With production problems well under control, the scientific method

should be applied with the same penchant for perfection to the marketing and distribution problem of the industry. Therein lies the insurance against the consuming fires of overproduction.

Quotation Marks

While agreements may be made in Europe of a nature to which American law and opinion are hostile, the cartel is not entirely unrestrained. Restrictive statutes are interpreted with liberality, however, with the result that business is unmolested in its combinations unless prices are raised to an extent definitely harmful to the consumer.—*G. M. P. Murphy & Co.*

No combines, cartels or trusts in chemistry can prevent, should they want to, an exceptional man from developing individuality, but he must be original. For the average well-trained chemist the big combines, conducted as they are with vision, afford a safer and more secure career on ordered and certain lines than did the smaller firms.—*Dr. Herbert Levenstein.*

One reason why scores of men fail in business is because they depend altogether upon their own little personal experience. They do not learn from books and lectures.

In these days business knowledge has grown too large to be learned in this way. Life is too short to learn by personal experience.—*Efficiency Magazine.*

It seems to me that the future historian will ascribe to propaganda a very large share of responsibility for America's progress, and that he will point to us, not as victims of propaganda, but as its beneficiaries.—*Edward L. Bernays.*

It is the country that has the courage to scrap its army most completely which may come nearest winning the next great war, if human foolishness does contrive another great war.—*H. G. Wells.*

When New England learns how to spend money in order to make more money, we shall hear less about New England slipping.—*A. Lincoln Filene.*

A politician thinks of the next election; a statesman, of the next generation.—*James Freeman Clarke.*

Management consists in finding out what should happen and them making it happen.—*Charles Edison.*

The industrial pioneering of the future will be done by great groups of trained men utilizing each other's scientific knowledge, rather than so much by the individual, as has been the case in the past.—*Charles M. Schwab.*

Science is in no sense a gamble. It is conservative business of the highest order. Those who ignore sound logic of science are the ones who gamble against heavy odds.—*O. H. L. Wernicke.*

The instincts of the people often come nearer the truth than the brainy lucubrations of intellectuals.—*Benito Mussolini.*

The textile industry in the United States is not yet fully sold on scientific research.—*American Dyestuff Reporter.*

New England is slowly but surely turning to chemistry.—*Business Chemistry.*

One offhand opinion by an expert is worth more than the views of a hundred amateurs.—*The Eaglet.*

The business man of today has to run like the devil in order to stay where he is.—*Merle Thorpe.*

Ten Years Ago

From our April issues, 1919

Leading manufacturers of sulfuric acid held meeting at Hotel Waldorf-Astoria, New York, to discuss disposal of Government stock of 9,000 tons.

E. I. du Pont de Nemours Export Co., opens main offices in New York City.

American Chemical Society formed Dye Division with Dr. J. M. Reese as president.

U. S. Alkali Export Association was incorporated with capital of $201,000 to engage in general import and export business. Horace G. Carrell, Eugene M. Taylor and Harvey M. Hacker were named as incorporators.

Tennessee Agricultural Chemical Corp. is incorporated at Columbia, Tenn., with capital of $2,000,000.

Corn Products Refining Co. agreed to sell certain of its plants as basis of settlement of suit brought against the company by the Government under provisions of the Sherman law.

Dr. Edward S. Johnson resigned as consulting chemist of Solvay Process and Semet-Solvay companies to accept a position with the U. S. Color & Chemical Co., Boston.

Grasselli Chemical Co. purchased a ten-acre tract near Milwaukee upon which to erect a plant.

Virginia-Carolina Chemical Co. plans construction of new plant near Jacksonville, Fla.

"NOW IT CAN BE TOLD"

Clarence P. Seaverns' Story of the "Old School" Chemical Trade

As Told to Williams Haynes

Chemical business conducted by very shrewd, very dignified gentlemen, pillars of the church and of society, who wore frock coats and silk hats to the office, who wrote their voluminous correspondence in long hand and "filed" it by letter press in copy books, to whom the telephone was a rare luxury, whose office hours were from seven in the morning to six at night, Saturdays included --- the old chemical trade of Boston seems now like a page out of Dickens, and yet Mr. Seaverns tells of men whose sons and grandsons are today active in chemical circles, whose names are familiar in corporation titles and trade-mark brands. This is the second of the series of chemical reminiscences to be followed by others.

AMERICAN industry was born in New England and Boston was its first market-place. Accordingly, long before the industrial demand for chemicals grew to a point that made chemical manufacturing a profitable venture, there was in Boston a flourishing trade in imported materials.

It was first a side line of the general trading business of the big merchants who brought from abroad any goods likely to show a profit — china and grindstones, molasses from Jamaica and flintlocks from London— and who shipped away salt fish, lumber, furs, rosin and pot-ashes. In Colonial times and afterwards, till our baby industries began demanding acids and alkalies, the chief chemical imports were drugs, dyes and paint materials.

Gradually, however, this extremely miscellaneous trade began to specialize. Some prosperous, aggressive Boston apothecary developed a wholesale business and began supplying his fellow druggists. It was an easy step to importing his own crude drugs and fine chemicals. It was a natural development to add dyes and later paint pigments to his line. There are still boss dyers in the New England mills who quite naturally speak always of the dyestuff store room as the "drug room," remembering thus the time, not so very long ago, when indigo and madder and logwood were truly vegetable drugs brought in sailing vessels from the Orient and the Indies. Some energetic and ambitious young clerk of one of the old general merchants—often with a wealthy uncle or father-in-law in the background as a silent partner—having especial experience in chemical or drug lines, branches out for himself. Or a disgruntled younger brother, or the incompatible sons of old partners, or the squabbling heirs of a rich and powerful house, would break up into separate firms and some of these smaller units would naturally, wisely determine to concentrate their efforts on particular lines of items. Thus the specialization continued.

In this way the chemical and drug trade of Boston began. Thus, too, there was a bewildering, often rapid change of personnel and firm names, for these early chemical merchants carried on a strictly personal business and there were constantly new partners added, old partners separating, and firms consolidating. A name still well known which has been grafted on what tradition says was the earliest chemical house still in existence in New England will serve as an example. Back in the early thirties, John N. Randall hired a likely boy named Jerome Marble. After the gruelling apprenticeship of the time, he went out to Worcester with C. A. Harrington & Co., an old house for which it has been claimed that the business was established as a drug dispensary and paint shop by the local physician in 1773. Jerome Marble literally worked up to a partnership and in 1863 took over the business, gave it his name, and took in as his junior partner Charles A. Hill. In 1869, Jerome Marble retired, selling his interests to his old partner and William H. Drury who was succeeded by Rufus S. Woodward in 1886 when J. Russell Marble and Francis A. McClellan, after fifteen and thirteen years

service respectively, were taken into the firm. Charles E. Eager became a partner in 1901 and three years later the firm name was changed to J. Russell Marble & Co. only to become in 1909, Marble-Nye & Company, upon the admission of Arthur Nye. Back in 1885 a Boston branch opened and the house has long been prominent in New England chemical trade where they have represented Diamond Alkali Company. The death of Russell Marble in 1928 closed three-quarters of a century's association of his family through this same firm with heavy chemical trade.

That story is typical not only of the gradually expanding business, but also the many changes of partners, and the long close identification of a single family with one firm.

Development of Chemical Merchant-Traders

These chemical merchant-traders first sprang into prominence after the War of 1812 when the initial impetus to our domestic manufacturing due to the blockade of imported manufactured goods during the war, was carried forward and fostered by our first deliberately protective tariff. They grew with the growth of industry. During the Civil War period the shrewder of them profited greatly; but the heyday of the chemical merchant princes was the half century between the Civil War and the opening of the World War. Rapid industrial expansion created an ever-growing demand for industrial chemicals, new chemcals, new uses, new markets, continually opened up before them. While competition was deadly, it was offset by the always wider fields of chemical consumption.

The period opened with imported chemicals in control of the market. "Desirable foreign connections" were the first assets of the successful chemical merchants. As the first American chemical manufacturers invaded the field, they found it expedient to turn over their selling to these same experienced merchants as sales agents. The change meant to them a closer connection with their source of supply, less costs for transport, and exclusive sales rights in their own territory.

It was only towards the close of the period that a few of the larger manufacturers began to organize their own sales forces and to call on the trade direct, but before the World War this direct distribution was but a tiny cloud no bigger than a man's hand which only disturbed a few of the most farsighted of these local distributors. During that half century they controlled the chemical sales. Success came only to the canny and the courageous. But success paid handsome cash dividends.

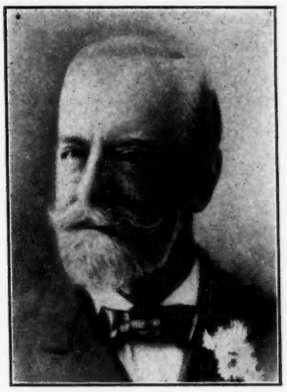
One bright Fall Monday morning in 1889, a sandy-haired boy entered with lagging steps the offices of Howe & French on Broad Street, Boston. He came reluctantly to work, not because the hours were long, for from seven to six was the regular working day, not because he had any preconceived dislike of chemical merchandising, but because his father had advised him to give up a position paying the munificient salary of six dollars weekly to associate himself with one of Boston's old and well established houses at a weekly wage of three dollars and fifty cents. In those days a father's advice was obviously something to be followed implicitly. The reason that prompted this advice is also interesting. Its wisdom has been justified. That youth—Clarence P. Seaverns—is now a dean among New England chemical merchants and president of the same "old and established house" he first went to serve forty years ago. He sits to-day at an oak roll top desk in an office in the front corner of the second floor of the same building. Half laughing at himself, he confesses that he has not yet come to the spacious room, the flat-top, walnut desk clean of papers, the Oriental rug, or the battery of push bells.

"Office boy to President would be a most misleading description of my business life," he assured me. "As a youngster, my favorite author was never Oliver Optic, nor was 'work and win' my motto. I just slithered along on a minimum of work and a maximum of luck. If you won't tell my clerks and salesmen, I have the keenest sympathy for every grandmother's funeral on the staff and a firm conviction that most of our big successful business men, if they would dare tell us so, are where they are because they had the breaks in the game."

So easy-going a philosophy, although belied by Mr. Seaverns' tremendous energy and his reputation as having been one of the very best of all chemical salesmen, doubtless accounts for his youthful appearance. He is trim and slim. His smooth-shaven face has hardly a single wrinkle. His hair is still more sandy than gray. One would hardly guess that he were as old even as the number of years he has been in the chemical trade.

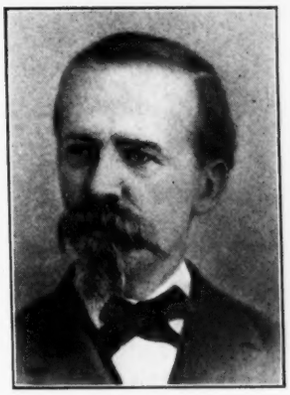
The old store on Blackstone st., Boston, is pictured in this advertisement extracted from the city directory of 1860.

"When I joined this house," he continued, "It was my duty to take long slips with the wants of our



John C. Howe (left) was a diplomatic, polished Boston gentleman; not close-fisted, but a keen merchant; a pillar of the church, but no Puritan.

John J. French was the more conservative member of the partnership, a keen trader of the Old New England school.



customers, which we could not fill, and get the quotations from other merchants in the trade. We had one telephone then, in Mr. Howe's office, but it was a luxury which certainly no three-dollar-a-half-a-week clerk dare use. But, I had the pleasant habit of dropping into a nice comfortable saloon famous for its free lunch and telephoning my wants about. I fear I won for Howe & French a reputation, not for progressiveness, but for reckless expenditure, before I was caught. And yet we were always a very alert house.

The Two Partners

"John C. Howe, our senior partner, was a forward-looking man. He was interested in the American Writing Machine Co., for example, and naturally, we had some of the first typewriters in Boston. It was he who got us into the manufacturing business at Weymouth where we made isinglass for the brewers. We own that same 18 acres of land to-day, but we are making lacquers and lacquer solvents in what used to be our isinglass factory. John J. French, partner, was our conservative member, a keen trader of the old New England school, who had been brought up, as boy and clerk, in the firm of Reed & Cutler, which eventually became the wholesale drug house of Cutler Brothers. Much of the active business during my early days was conducted by several of Mr. Howe's brothers-in-law, the Ripleys. Peter Ripley had entire charge of the daily routine downstairs and to-day would classify as general manager. He was a regular martinet—punctuality and obedience, both without any ifs or ands or buts, were the first and last of his rules. I did not like it at the time, but to be on time and to obey have been invaluable lessons. He taught them thoroughly even to a little physical persuasion if a pupil was a little dull or slow.

"Mr. Howe was quite a different type, a diplomatic, polished gentleman of New England, not so close-fisted as some of our neighbors, but a keen merchant; a pillar of the church, but no long-faced Puritan. I remember now the heavy, black, expensive Havana cigars he smoked; the twinkle in his eye; and his caustic wit. Once he sent me to the bank with some checks to cash and when I gave him the money he upbraided me seriously because I had been so careless as to accept one hundred dollars too much from the teller. 'Go right back,' he said sternly, 'and report the mistake and don't forget to apologize.' I approached the teller's window with fear and trembling. 'Please excuse us,' I said, 'but you have made a mistake.' "

Old Time Sales Methods

"The high and mighty person behind the bars interrupted me, violently assuring me that this particular bank never made a mistake. Try as I would he would interrupt always, and I returned doubly frightened to Mr. Howe. When he heard my story, he smiled and said, 'I don't want more money than my checks called for, and if that bank never makes a mistake, it appears to me that you are in just one hundred dollars.' The cashier, however, when he found his mistake, gracefully accepted the return of the money.

"In those good, old, pre-prohibition days, there was a great deal of entertaining. Hundreds of good chemical sales were made in the bar of the old Parker House, and there was in most every firm some bright young man who was going the pace for the good of the order book. I was elected to this dangerous outpost on the sales firing line, and a couple of times a week Mr. Howe used to call me into his office and go through this euphoneous formula of instructions. 'Clarence, Mr. Amos Barton of Springfield is coming to town to-morrow. I don't believe he's ever seen Faneuil Hall Market, and I wish you'd take him out and show him all the historic monuments of Boston." That was all, but I knew that I was to take Mr. Barton out and entertain him up to the limit of fifty dollars. To that limit no questions were asked. Over that limit there was a call for a complete and embarrassing accounting. But in those days, fifty dollars bought a considerable variety and generous quantity of entertainment."

In reply to my inquiry as to how he would distinguish the most significant difference between the old and the new ways of doing chemical business, Mr. Seaverns replied at once, "It was more simple and more profitable."

"What I mean," he added, "is that we did more business with less overhead. About half the number of people were needed. Not that the long hours

meant more work, for the whole pace was slower; but our records consisted only of Books of Account and a copy press for letters. The one thing all houses demanded was a profit and loss statement on the second of the month. Now we have letter files and card files, salesmen reports and statistics and analytic statements of goods, and departments and territories and what not, till we spend half our out-go on records.

"Then too, we only had one salesman. Our man was Morse, a little chap with an enormous moustache, who covered all of Vermont, Maine and New Hampshire. Freeman Rice, buyer and sales manager, always in a cutaway coat and derby hat, the standard of dress at that time, used to call on the city trade while I, as office boy, called to see our competitors for sundry prices which were always quoted without reference to price lists, as prices, stocks on hand were carried in the head.

"For another thing our lines of goods were much broader and our business partook more of an international character. While the house always specialized in acids, nevertheless, shellac was one of our main lines and we had direct connections all over the Orient on this material. Some of the houses did an enormous business in indigo and madder from India and logwood from the West Indies and South America. But our work was always more along the lines of the paint materials rather than dyes. Even so, we did not specialize in the sense that is common to-day, and we were always prepared to sell anything from alum to zinc dust and sometimes got far away from either chemical or drug lines.

Boston's Biggest Piece of Ambergris

"On May 12, 1911 one of our close business friends, engaged to the whaling business, had a vessel which off the west coat of Africa picked up what later proved to be the biggest piece of ambergris ever brought into Boston. Four rolling tars carried the great chunk as big as a hogshead into the office, slung in a sailor's hammock, and we were commissioned to sell it. Buyers from all over came to see it and although it was stored in one of our vaults, its sweet-bitter odor perfumed the whole premises. It was finally purchased by a syndicate headed by Dodge and Olcott, and if I remember correctly, the price ran into six figures.

"Another big difference," continued Mr. Seaverns thoughtfully, "was the character of the men in the business. They were David Harum traders; close and shrewd, but honorable gentlemen; often conservative to a fault, tenacious competitors and plucky speculators in a market that fluctuated high and wide. One of Mr. Howe's marked characteristics was his high sense of public responsibility to his customers. It went deeper than his contract obligations, which were inviolate; it imposed on him the necessity of carrying spot stocks even in unprofitable, falling markets so that we might always be in a position to supply our customer's needs. He felt this was our duty, our right to existence as merchants. The other leading chemical houses had similar high ideals of obligation and service.

Rounding out Mr. Seaverns' story of the Old School chemical merchants it is interesting to trace out briefly the history of some of his "rivals" of those days.

The house of E & F King began as Pratt & King (Eleazir Pratt, druggist and Edward King, merchant) in 1834 at 26 India Street where they remained for seventy-nine years till they moved to their present big building on Atlantic Avenue in 1912. In 1839 Mr. Pratt withdrew and Mr. King took in his brother, Franklin. In 1846 George Dexter, who was office boy when the doors were first opened, was admitted to partnership and for several years the sign over the door at 26 India Street read King & Dexter. George Dexter and his brother, Charles, retired in 1859 and the old firm style of E & F King was resumed and retained after Edward King also retired at the close of the Civil War. During the next twenty years, Franklin King admitted to partnership William M.

APRIL 25, 1865.

HOWE & FRENCH,

IMPORTERS AND WHOLESALE DRUGGISTS,

69 & 71 Blackstone Street,

BOSTON.

PRICES SUBJECT TO DAILY VARIATION. TERMS CASH.

GOODS FREIGHTED TO THE WEST AT AS LOW RATES AS FROM NEW YORK, AND AS QUICKLY.

ACID, ACETIC	carboy, 40	lb.	45	FLOWERS, ARNICA	lb.	40
" BENZOIC		oz.	@ 65	" CHAMOMILE	cask, 35	"	30
" CITRIC	kegs	lb.	1.19	" LAVENDER		"	50
" NITRIC	by carboy, 19 & 21	"	25	FOL. SENNA		"	35
" MURIATIC	by carboy, 6	"	10	" ALEX		"	35
" OXALIC	by bbl. 45	"	47	" UVA URSI		"	30
" SULPHURIC	by carboy, 41	"	6	GLUE, Common	bbl. 18	"	15
" TARTARIC		gr.	1.10	" Extra	bbl. 14	"	18
ALUM	bbl. 5	"	7	" Frozen	cases	"	15 to 20.
" Ground	bbl. 84	"	8	" Bonnet, Cooper's	bbl. 35 & 40	"	45
AMMONIA AQUA	carboy, 16 & 19	"	@20	GUM, ALOES, Cape		"	40
" Conc	carboy, 26	"	28	" " powdered		"	50
" CARBONATE, Eng.	in jars	"	30	" Socotrine, true		"	1.00
" MURIATE		"	20	" ARABIC, India		"	
ANNATTO, English	in rolls	"	45	" Turkey, 1st select		"	70
ANTIMONY, Powdered		"	9	" " 2d "		"	60
ARROWROOT		"	18	" " 3d "		"	55
" Jamaica	in tins	"	35	" Sorts		"	45
" Bermuda		"	70	" Powdered, pure white		"	50
BALSAM, COPAIVA, Para		"	1.00	GAMBOGE, Pulv		"	1.00
" Fir	in bottles, dez. 7.50	gall.	8.50	MANNA, Small Flake		"	
BARK, BAYBERRY		lb.	10	MYRRH, Turkey		"	60
" ELM	bundle	"	20	" " Pulv		"	75
" " pur		"	30	OPIUM, Turkey, (market rate)		"	
" PERUVIAN		"		SHELLAC, English Orange		"	90
" " powdered		"	50	" Native Orange		"	85
" SASSAFRAS		"	20	SPRUCE		"	80
BAY RUM, pure		gall.	4.75	TRAGACANTH, Best Sabo		"	1.87
BORAX	by bbl. 30; by case, 40	lb.	42	" " 2d "		"	1.10 & 1.25
BRIMSTONE	by bbl. 64	"	6¼	" " Sorts		"	87
BURGUNDY PITCH, White	boxes	"	25	IODINE, Eng. Morson's - 1 lb. bottles, 8.00		doz.	80
BLUE PILL	in 1 lb. pots	"	90	INDIGO, Bengal		lb.	
CANTHARIDES, powdered		"	2.00	" Manila	all qualities, from	"	1.00 to 3.00
CASSIA BUDS		"	2.25	IRISH MOSS, Common	bbls. 84	bu.	2
CAYENNE, BIRD'S EYE, pure		"	60	" Extra	bbls. 6 & 10	"	13
CAMPHOR		"	1.00	ISINGLASS, American		"	70
CARB. MAGNESIA, 3 ounces, small sq. cans		"		" Cooper's	by case, 10 lbs.	"	90
" " 2 oz. papers		"	50	MACE		"	
CLOVES		"	50	NUTMEGS, Penang	by case	"	1.60
CHLORIDE OF LIME	by bbl.	"	5½	OATMEAL, Fresh	by bbl.	"	5
CORKS, BOTTLE	assortment, from	"	80 to 1.25	OIL, ALMONDS, Essential		lbs.	1.25
" DEMIJOHN	"	gross	1.00 to 1.50	" " Expressed, true, lb. bottle		gr	90
" VIAL, Common	"	"	12 to 50	" " common		"	
" " Superfine		"		" ANISE	by can, 5.00	lb.	5.25
" every kind and qual. at lowest rates.		"		" BERGAMOT		"	7.00 & 9.50
COCHINEAL, Honduras		lb.	1.50 & 1.62	" CARAWAY		"	4.50
CREAM TARTAR, Pure		"	65	" CASSIA		"	5.00
CUBEBS		"	62	" CEDAR, pure		"	75
CUTTLE-FISH BONE		"	83	" CLOVE		"	5.00
EMERY, English, of all sizes		"	12	" CROTON		"	60
EMP. ADHESIVE		"	30	" CASTOR, East India	by case, 2.62	gall.	3.50
" spread		yard.	42	" "	in bbls.	"	
" CANTHARIDES, superior		lb.	1.42	" FIR		lb.	75
" DIACH. SIMP		"	38	" HEMLOCK, true		"	85
" " Com. Gum		"	30	" LEMON		"	3.75
" OLIVE		"	50	" ORIGANUM, true		"	3.25
EXTRACT, ACONITE, English		"	5.50	" OLIVE, Pure		gall.	3.75
" " LA DONA, English		"	4.00	" " Quarts, genuine		doz.	7.50
" " CICUTA, English		"	2.25	" " Pints	cases of 2 doz.	"	11.00
" " DANDELION, English		"	1.75	" PEPPERMINT, Pure, Hutchins		lb.	6.00
" " GENTIAN		"		" ROSEMARY		"	1.50
" " HENBANE, English		"	6.00	" SASSAFRAS		"	1.00
" " LIQUORICE, Sicily, true		"		" SPRUCE		"	60
" " " 2d		"	38	" SPEARMINT, Prime		"	
" " CALABRIA		"	30	" TANSY, Prime		"	4.50
" " " Imitation		"	25	" WINTERGREEN, Pure		"	3.75
" TILDEN'S SOLID & FLUID		"		" WORMWOOD, Pure		"	3.75
" THAYER'S " "		"		" NEATSFOOT, Extra		gall.	1.25

This 1865 price list furnishes an interesting basis for comparison with prices existing to-day.

Bates, William Agge, Daniel G. Tyler, and his nephew, George King. In 1875 his own son, Samuel, entered the house and became a partner five years later. His son's son, Gelston King, representing the third generation is to-day in charge of the active management.

For many years, Franklin King was a dominating figure in the Boston chemical trade. His house was

one of the first to specialize in alkalies and was long headquarters too for oxalic acid. He was a New Englander of vigorous personality and rugged independence of thought, who though he was accounted a very wealthy man, remained simple in his habits. Twitted once by some of his friends that his son should drive to the office in his own brougham behind

Clarence P. Seaverns, present head of the Howe & French organization, whose reminiscences form the basis for this story of the old days in Boston.

a spanking pair while he still used the tram cars, he replied, "Well, you see, Samuel had the advantage of having a wealthy father." Mr. King died at the good age of ninety, on August 29, 1898.

Another distinguished citizen of the chemical trade was George Von L. Meyer, Roosevelt's Secretary of the Navy and Ambassador to both Russia and Italy, who was son of George A. Meyer, founder with George Linder of Linder and Meyer. This firm continues as Linder & Company, headed by John Linder, son of the original senior partner.

In 1839 John A. and William Bird, brothers, with John W. Randall established themselves at 53 Chatham Street, Boston, as chemical merchants under the firm name of J. A. & W. Bird. Six years later, Mr. Randall left to form Henshaw & Randall and the following year, another brother, A. Signourney Bird came into the partnership. In 1869 William B. (son of John) and William H. (son of William) were admitted and in 1874 Edward V. (son of Signourney), so that, thought Charles Carruth (1876) and John F. Phillips (1883) were also partners, the firm was predominating an affair of the Bird family. The character of the business changed from general chemical trading to special manufacturing and the importation of casein for the paper industry.

Three out of four of these chemical merchants' houses are still active and in two of the management is vested to-day in sons or in grandsons of the old families. But the business has changed from merchant, to sales agent, to chemical specialist—nor is the end of this change still in view.

Alberta Wood Preserving Co., Edmonton, following recent merger with the Dominion Tar & Chemical Co., now handles all business in four Western provinces previously handled by Canada Creosoting Co. and the Vancouver Creosoting Co.

The Editor's Correspondence

Patent Rights Again

Editor, Chemical Markets

While Dr. Grosvenor has pointed out some defects in our patent system and we agree with him on many points, we believe that he should also bring out the fact that an inventor sometimes secures a much longer monopoly than we believe he is entitled to receive because it is possible to keep the application in the Patent Office for a long period of time. During all this time this application is kept a secret from the public.

In the meantime many other inventors may be working on the same invention and in some cases a manufacturer has built up a business on a device which later becomes the subject matter of a patent granted to an inventor who happens to have applied for patent at an early date and whose application was held up in the Patent Office. Since our work is along development lines we know this to be a very disturbing factor and we are of the opinion that if inventors are to be granted broad valid patents as suggested by Dr. Grosvenor the other inventors and industries should have some knowledge of the existence of such a broad application in the Patent Office. This is taken care of very nicely by the patent procedure in the British Patent Office.

It also does not seem fair that a patent should be granted for the full term of seventeen years if the inventor can keep his application in the Patent Office for ten or twelve years. I do not believe that the patent should date from the date of application but I believe that the inventor should be allowed a reasonable time to prosecute his application and the patent should date from a period, say of two years after its filing, except possibly in cases where the inventor gets into interference proceedings and the like.

C. F. Burgess Laboratories, Inc.,
By O. W. Storey,
Patent Department.

Madison, Wisc.,
21 March, 1928.

German potash industry is planning to produce mixed fertilizers similar to those manufactured by the I. G., according to the Department of Commerce. The first potash concern to enter the mixed fertilizers business is the Wintershall concern. The Neustassfurt-Friedrichshall potash concern which merged in 1928 with Rhenania-Kunheim of Berlin into so-called Kali-Chemie Aktiengesellschaft is reported to contemplate production of a mixed potash-phosphoric acid fertilizer. Rhenania-Kunheim features phosphate fertilizers with its general production of heavy chemicals and at present is producing "Rhenania" phosphate. It is not unlikely that Salzdetfurt-Westeregaln-Aschersleben which is now in process of increasing its capital, may be interested in entering mixed fertilizer production as might also the Kruegershall Aktiengesellschaft, recently formed by a merger of the Burbach and Gumpel potash interests.

Royal Dutch-Shell oil group is participating financially in the Dutch nitrogen products factory at Ymuiden. It is suggested in the German Press that this may involve the formation of a new European nitrogen concern whose activity, on the basis of the Mont-Cenis patents, would be in the first place directed against the I. G. It is thought in some circles that the Royal Dutch-Shell group may undertake the large-scale manufacture of nitrogen compounds in the United States.

Japan Chemical Industry Co., Ltd., succeeds in making a potassic fertilizer by a special process invented after many years of research work, says a report from Shanghai. Present annual capacity is about 10,000 tons, to be increased later to 20,000 tons.

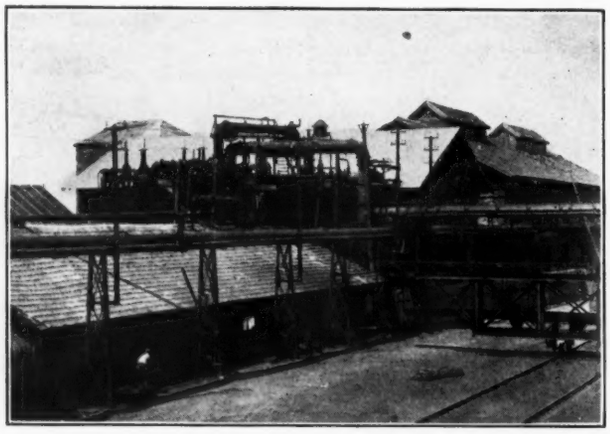
SOVIET RUSSIA'S C

The Russian communistic experiment has included in its plans the work of rehabilitating the entire chemical industry in every branch. This has been done by placing control in the hands of a single group of men who are absolute dictators of the chemical industry's destinies.

DURING the past five years the Soviet chemical industry has made rapid strides, exceeding considerably the general rate of development of Soviet industries. The value of the output of all branches of the chemical industry (including the rubber and match industries) in the fiscal year 1927-28 was 627,200,000 rubles, as compared with 506,700,000 rubles in 1926-27 and 177,000,000 rubles in 1922-23. The increase last year over the preceding year amounted to 23.8 per cent. The share of the output of the chemical industry in the gross output of Soviet industry as a whole increased from 4.7 per cent. in 1922-23 to 7.2 per cent. in 1926-27.

The status of the Russian chemical industry in pre-war times was even below that of the generally low level of Russian industry. Such important branches of the chemical industry as the production of synthetic dyes, medical and laboratory supplies, photo-chemicals, mineral fertilizers, coking by-products, practically did not exist. Most of the existing chemical plants were technically backward and their output fell far short of satisfying the needs of the country, making it necessary to import considerable quantities from abroad—mostly from Germany.

The world war, by cutting off entirely the imports from Germany and restricting imports from the allied countries, brought about a considerable development of the existing chemical industries and the establishment of a number of new ones (coke-benzol, pharmaceuticals, etc.). The production of acids, especially sulfuric acid, was given a particularly strong stimulus, although the output was held back by the insufficient supply of pyrites, which before the war were largely imported from Spain. The establishment of large-scale production of sulfuric acid called for a considerable development of pyrite mining and smelting.



A view of the exterior of the chemical works at Donetz Coal Basin. The Soviet Government is establishing many similar plants throughout Russia.

The years of civil war wrought heavy damages to the chemical industry. Moreover, a large number of the leading engineers were foreigners, most of whom left the country during this period. This made the task of reconstructing the chemical industry doubly difficult. Nevertheless, due to the special attention devoted to it by the government, the industry has not only recovered from the depression of the civil war period but has also surpassed the pre-war level.

The number of workers employed in the chemical and allied industries last year averaged 151,100. The chemical industries proper employed an average of 76,800 workers during the first three-quarters of the year, an increase of 6.3 per cent. over the preceding year. This indicates that the considerable gain in output (22.4 per cent.) is due primarily to increased productivity of labor. The value of the monthly output per worker increased from 613 rubles in 1926-27 to 770 rubles in 1927-28.

The principal branches of the chemical industry are those devoted to the manufacture of fat and perfumery products including soaps, candles, glycerine and cosmetics, and the basic chemical industry, which manufactures acids, alkalis and fertilizers. The following table shows the growth in the output of the various branches of the chemical industry proper during the past three years:

Branches of Industry	*1925-26*	*1926-27*	*1927-28* (*in millions of rubles*)	*% increase over 1916-27*
Basic (acids, alkalis, superphosphates)	61.0	68.6	81.7	19.0
By-Product Coking	9.8	15.5	18.4	18.7
Wood Distillation	6.2	6.0	8.5	41.6
Aniline Dyes	19.3	28.2	34.6	32.7
Paints and Varnishes	31.8	36.2	44.8	23.7
Pharmaceuticals and Drugs	21.9	29.5	35.2	19.3
Fat Products and Perfumes (Soaps, etc.)	80.0	133.9	182.3	36.1
Bone Products (Glue ground bone, etc.)	7.9	11.3	12.0	6.1
Miscellaneous		13.8	16.7	20.9

A notable feature of the industry has been the rapid development of the basic chemical industries, the production of acids last year increasing 13.5 per cent.

CHEMICAL PROGRESS

In view of this determined effort by the Soviet Government to rehabilitate Russia's chemical industry, this article by S. S. Shipman, of the Amtorg Trading Co., is of particular importance as outlining the present progress and future plans of this huge industrial program.

alkalis 17 per cent. and superphosphates 72 per cent. over the preceding year. The following table gives the production of these industries for the past three years and for 1921-22:

Years	*Acids* (*in Metric tons*)	*Alkalis*	*Superphosphates*
1921-22	46,700	46,200	4,300
1925-26	220,790	199,630	80,620
1926-27	260,660	243,050	89,990
1927-28	295.820	284,720	155,000

In the past two years caustic soda has made up over 70 per cent. of the output of the alkali industries.

The development of the by-product coking industry in the Donetz and Kuznetz Basins has laid the basis for the building up of an independent aniline dye industry. Last year coke production totaled about 4,000,000 tons, an increase of 15 per cent. over 1926-27. The domestic manufacture of organic dyes, which in 1926-27 amounted to 7,541 metric tons and last year to over 10,000 tons, now takes care of a large part of the requirements of the textile industry of the U.S.S.R. while before the war the Russian textile industry was entirely dependent on German dyes. The same applies to the pharmaceutical-chemical industry, which was practically non-existent in Russia before the revolution. Many drugs and other medicinal supplies which were formerly obtained exclusively through imports are now produced in the Soviet Union from its own raw materials.

The production of many other chemicals, which were never before manufactured in Russia, has been organized. These include red phosphorus for the match industry, potassium fluoride used for the impregnation of railroad ties, formic acid for the textile industry, carbon bisulfide for the rubber industry, etc., hypo-sulfites, alums, barium chloride, sodium fluosilicate, magnesium sulfate and many other products.

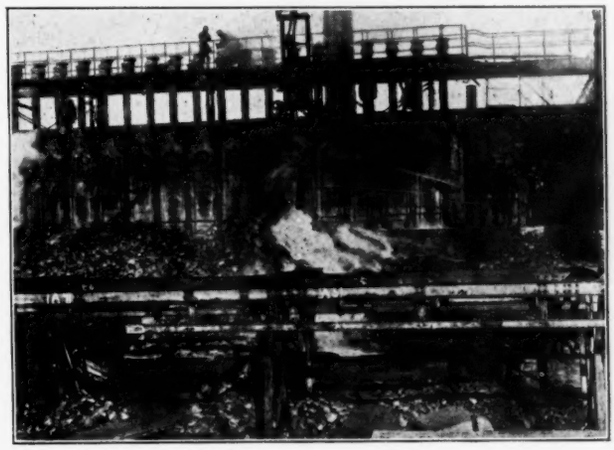
In the aniline dye industry the production of finished dyes and intermediates, which were formerly supplied exclusively by importation, is at present organized in the U.S.S.R. on a large scale and practically covers the requirements of the textile industry. Sulfur black, salicylic acid, aniline, beta-naphthol, paranity-aniline, benzidine, naphthionates, sulfanilic acid, etc. are some of the aniline products now being manufactured on a commercial scale. Plants for turning out H acid and gamma-acid have also been built. The Soviet aniline dye industry furnished last year over 80 different dyes, including a number of fast colors such as sulfur and diazotized dyes.

The Leningrad Paint Trust has organized the production of celluloid, which was never before produced in Russia, and also of synthetic camphor from fir oil, which is available in ample quantities in the Soviet Union. The Trust has also started the manufacture of synthetic resins and varnishes for the automotive and aeroplane industries.

Other plants are producing boric acid for medicinal purposes and also essential oils for the soap and perfume industry. In the near future it is expected that the Soviet Union will be able to dispense with the German and French imports of these products.

Many pharmaceutical preparations which were not manufactured in the country are also now being produced in the U.S.S.R. These include opium alkaloids (codeine, morphine, heroin), iodine compounds, salicylic acid and salicylates, aspirin, methyl-ether, many mercury compounds, bromides, chemically pure caustic alkalis, adrenalin; neo-salvarsan, lunar caustic, iodoform, atropine, cocaine, technical and medicinal tannin, pepsin, and numerous others. Laboratory researches are being carried on with a number of other drugs, including insulin, veronal, etc., with a view of organizing the manufacture of these products in the Soviet Union on a commercial scale.

The pharmaceutical industry is controlled largely by the state trust "Gosmedtorgprom" (State Medical Commercial and Industrial Trust). In 1926-27 the industry produced 5,136 metric tons of medicaments,



The Frunze Konstantinov metallurgical works in the Donetz Coal Basin, showing some of the coke ovens, of which there are forty in this plant.

while reports for the first nine months of 1927-28 show an increase of 43 per cent. over the preceding year.

Although the manufacture of chemicals and drugs not produced in Russia before the war may be considered an important development, the Soviet Government is laying the main emphasis on the expansion of mass production of the basic chemical products required by industry and agriculture. Though above its pre-war level, the Russian chemical industry still falls short of satisfying the steadily growing demands for its products. According to Glavkhim, the chemical branch of the Supreme Economic Council, the domestic chemical industry is in a position to satisfy only about 72 per cent. of the market during the current fiscal year. The proportion of the total demand to be met by the home industry this year is estimated at 88 per cent. for sulfuric acid, 90 per cent. for caustic soda, 65 per cent. for potash, and, most serious of all, only 50 per cent. for mineral fertilizers.

Demand Exceeds Supply for Fertilizers

Although the production of fertilizers was almost three times the pre-war output last year, the development of this industry lags far behind the needs of agriculture. The extensive educational campaigns conducted by government agricultural exports have exerted a great influence in increasing the demand for fertilizers. According to the estimates of "Gosplan" (State Planning Commission) the total quantity of mineral fertilizers, to be produced in the U.S.S.R. this year will be about 378,000 metric tons, including 260,000 tons of superphosphates, 60,000 tons of ground phosphorite, 31,700 tons of ground bone, 7,100 tons of nitrates and 19,000 tons of ammonium sulphates. The production of mineral fertilizers amounted to 209,000 tons last year and to 135,000 tons in 1926-27. Potassium fertilizers have as yet been produced only in small quantities. However, the discovery of the tremendous Solikamsk potash deposits in the Urals has opened up wide possibilities for this industry. Exploitation of the deposits has already been started. The production of nitrates will be greatly expanded by the construction of the Dnieprostroy hydro-electric plant, in the vicinity of which it is planned to build a number of nitrate plants to use the cheap power from Dnieprostroy. Many other chemical plants, including factories for the manufacture of caustic soda and calcium carbide, are planned for the Dnieprostroy region.

The wood distillation industries, based on the enormous timber resources of the U.S.S.R. are also undergoing considerable development. The manufacture of turpentine-colophany and similar products has been started. Plans are under way to expand the production of acetic acid, methylene, acetone, etc. The extensive timber resources and utilization of wood for fuel in Russia (the Urals metals industry alone consumes 4,000,000 cubic meters of wood annually) offer an extremely favorable basis for the further expansion of the industry. The five-year production plan of the wood distillation industry provides for the construction of thirteen new plants to be concentrated mostly in the Urals, the basic product of which will be acetic acid.

In the past three years about 160,000,000 rubles has been invested for new construction, equipment and capital repairs in the Soviet chemical industry, not including allied industries.

Capital investments in the past two years have been as follows: 60,100,000 rubles in 1926-27; and 73,100,000 rubles in 1927-28. For the current fiscal year 146,800,000 rubles has been allotted for additions and improvements to the chemical industry.

In 1926-27 imports of chemical products into the U.S.S.R. amounted to 67,532,000 rubles and imports of equipment for chemical plants to 6,997,000 rubles, as against the corresponding figures of 75,576,000 rubles and 3,433,000 rubles in the preceding year. Annual imports of dyes and paints have averaged over 11,000,000 rubles in the past two years, imports of drugs totaled 9,500,000 rubles in 1926-27, while imports of tanning materials amounted to 11,678,000 rubles in 1926-27 and 14,720,000 rubles in 1927-28 (across European frontiers only). Small quantities of turpentine, pitch, alkalis and other chemical products are exported.

Japan's Ammonium Sulfate Imports From United States Show Decline

Japanese imports of ammonium sulfate from the United States during 1928 declined sharply from those of preceding year due to unusually large imports from England and Germany. Imports during 1928 totaled 275,000 tons, valued at yen 36,304,000, a gain of 30,000 tons and yen 3,553,000 over 1927. Of this amount, 147,958 tons, as compared with 135,431 tons in 1927, came from Germany; 96,369 tons, as compared with 60,000 tons, from Britain; 28,189 tons, as compared with 40,418 tons, from the United States; and 5,691 tons, against 7,196 tons, from other sources.

Demand for ammonium sulfate in that country threatens to decline because of increasing consumption of lime nitrogen. Consumption of the latter during 1928 totaled 40,000 tons, an increase of 30,000 tons over 1927. The 1929 consumption is estimated at 60,000 tons.

Imports of Chilean nitrate during 1928 totaled yen 6,108,000, a decline of yen 646,000 from 1927; phosphatic ores, yen 11,975,000, a gain of yen 1,213,000; and soy bean cake yen 86,827,000, a decline of yen 12,152,000. Caustic soda and soda ash imported amounted to yen 13,363,000, an increase of yen 1,120,000. Artificial indigo and other synthetic dyes imported amounted to yen 9,923,000, a gain of yen 2,124,000.

In 1926 the United States got only about three per cent. of Argentina's aluminum sulfate business. This compares with 40 per cent. to Germany; 36 per cent., Great Britain; 13 per cent. Belgium; and six per cent., France. United States exports of this chemical to Argentina have fluctuated considerably: 1923, 157,362 pounds; 1924, 61,551 pounds; 1925, 233,200 pounds; 1926, 115,835 pounds; and 1927, 30,800 pounds. Total imports of aluminum sulfate into Argentina have been as follows: 1924, 456,975,000 pounds; 1925, 283,504,000 pounds; 1926, 451,584,000 pounds; 1927, 432,866,560 pounds.

Copper Sulfate PRICES

Phenomenal price advances during the past few months focus interest on copper sulfate. Herein is the story of a quieter, but even more interesting development of new demands for this chemical extending from the battery and textile fields, into insecticide and reclaimants.

By G. P. Hitchcock
Nichols Copper Company

COPPER sulfate is produced in the United States chiefly as an incident in the electrolytic refining of copper. While it is possible to produce this chemical directly from copper and sulfuric acid, it is not economical to produce it in this manner, because such product would have to be sold against the large and reasonably stable production of the copper refiners whose costs are bound to be lower than those of a producer not connected with copper refining.

The United States Department of Commerce compiles the production figures of copper sulfate every two years, but the figures for 1927, when the last census was taken, are not yet available. In 1925 the amount produced in the United States was 32,296,583 pounds, valued at $1,683,788. This compares with 32,304,421 pounds, valued at $1,777,663 in 1923; 27,221,704 pounds, valued at $1,767,695 in 1921; and 35,287,881 pounds, valued at $3,164,611 in 1919. While authoritative figures showing annual production since 1925 are not available, it is estimated that production for 1928 was approximately 45,000,000 pounds.

Since 1919 there has been a steady increase in the agricultural use of copper sulfate. The practice of spraying vines, fruit-trees and vegetables with Bordeaux mixture or dusting them with copper-lime dust, is extending rapidly everywhere. Potatoes and apples cannot be grown commercially without spraying. The same is true of celery and citrus fruits.

Another gradually widening field for the use of copper sulfate is in the treatment of water supplies. This is not a new use, as some communities have treated their reservoirs with copper sulfate for many years, but of late many other communities have adopted the practice. This requires the lake or pool to be traversed by a boat or a bag containing crystals so that all parts are evenly supplied with the resulting solution. This application controls the microscopic organisms which produce tastes and odors in the water; also it removes the unsightly algae and scums which accumulate on the surface in the summer months. Copper sulfate is also one of the best fungicides for use in swimming pools.

Still another use of copper sulfate, one which is likely to call for substantial quantities of the chemical,

The practice of spraying vines, fruit trees and vegetables with Bordeaux mixture has extended rapidly since 1919. This picture shows the spraying of potatoes, which cannot be grown commercially without this application.

is in the treatment of sterile soils. It has been found that recently reclaimed peat soils must have certain metallic salts directly supplied before the plant will grow to maturity. The most striking response is secured by the application of copper sulfate. Manganese and a few other metallic salts are also effective in these soils, but not in so marked a degree. When it becomes profitable to reclaim such lands, a new outlet will be opened.

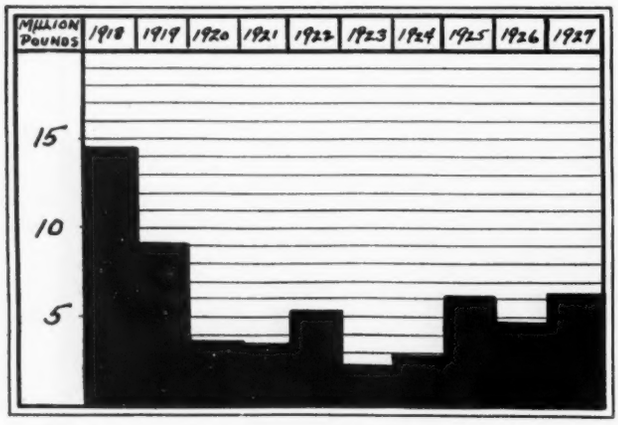
Copper sulfate has come into rather large use in the recovery of metal values by the method of differential flotation, making it profitable to treat material carrying low metal values which hitherto have not been considered worth treatment. This calls for substantial quantities of copper sulfate in mining districts.

The foregoing fields of consumption undoubtedly have expanded during the ten-year period since the war and the outlook for further expansion is good.

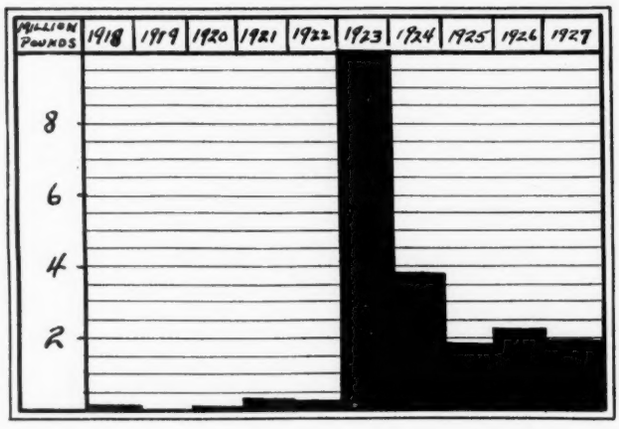
On the other hand, the use of copper sulfate by the railroads in their signal batteries has declined within ten years from a very considerable tonnage to an almost negligible amount. Other types of cell have replaced the gravity battery using copper sulfate, and in many instances, the railroads are using their power lines to operate their signals.

Owing to change in the demand for certain fabrics which require copper sulfate in their preparation, there has been a marked decline in its use by textile manufacturers. During and immediately following the war, a large tonnage went into this field which now calls for much less.

The refiners produce a sufficiency of material to supply the requirements of the United States together with an exportable surplus which has amounted, in recent years, to five or six million pounds per year. Most of the exports are to Canada, Mexico, Central and South America, transportation charges making it unprofitable to export to continental Europe. During and immediately following the Great War, however, substantial tonnages were shipped to the Mediterranean countries which are large users of copper sulfate. The export trend since 1918 is shown in this chart:



The price of this commodity in the latter part of 1918 was from 8½ to 9 cents per pound. A gradual decline, following the lower price of the metal brought the price in 1924 down to about 4½ cents. During the last two or three years, there has been a slow, but steady increase, so that now copper sulfate sells in New York at about 6½ cents in carlots with a strong upward tendency owing to the strength of the copper market. As copper is the chief factor in the cost of producing the sulfate, price changes in the latter usually follow changes in the price of copper. The low prices of 1924-25 were affected also by the large imports of copper sulfate in 1924 from Europe. Excess stocks, made from wartime scrap then abundant in Europe, were dumped in the United States, glutting the market and depressing prices over a long period. This scrap copper was entirely consumed after a year or two so that European producers have production costs equal to or higher than those of American producers. The comparative imports by years since 1918 are illustrated in the following chart:



The essential features of the process of manufacture have not changed during the past ten years, but certain mechanical aids have been introduced in the method of crystallization and in the handling of the crystals, all of which tend to speed up production and reduce to some extent the labor cost.

Copper sulfate is not only a fungicide of wide application in agriculture, but owing to its low cost and its tonic effect on vegetation, it is also one which is not likely to be displaced by any other chemical having fungicidal power. Consequently, future demand promises to increase rather than to diminish.

The United States furnishes the bulk of the Philippine fertilizer supply, according to the Department of Commerce. Last year 28,269 of 34,533 metric tons came from the United States. The principal strength of the American products in this market is in the sales of ammonium sulfate, of which the United States furnished practically the entire amount. The increase in imports of mixed fertilizer from 240 tons in 1926 to 1,347 tons in 1927 is entirely due to the larger shipments received from the United States.

The demand for superphosfates, which in 1926 was supplied by Japan, was in 1927 largely taken care of by imports from the Netherlands. The share of the United States in the superphosfate trade of the Philippines is insignificant

National Fertilizer Association will hold fifth annual convention, June 10-13, at the Hotel Griswold, New London, Conn.

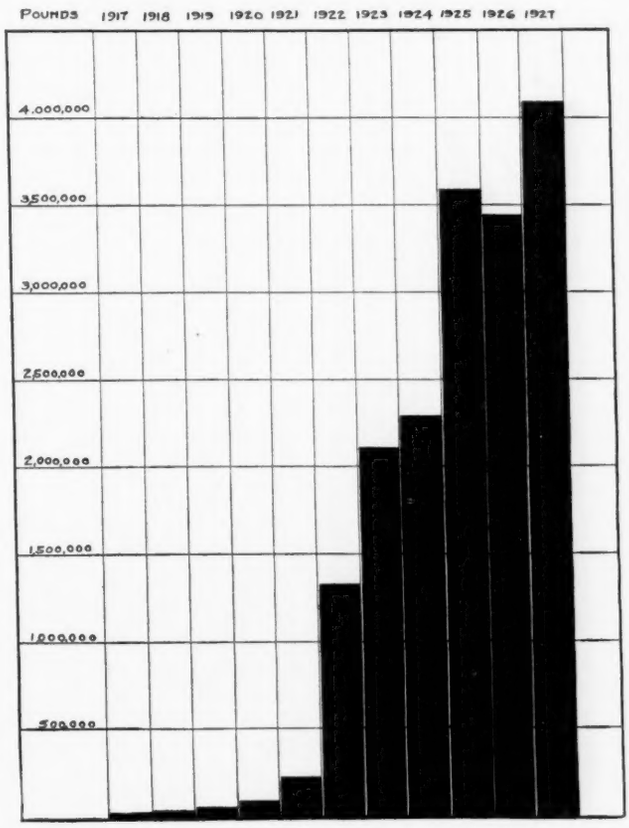
A Decade's Developments in Phthalic Anhydride

By J. M. Selden, Jr.
Vice-President, The Selden Company

DEVELOPMENT of the use of phthalic anhydride during the past ten years has been increasingly rapid and interesting in nature. Before the war, the uses of phthalic anhydride were limited to the dyestuff industry. This use, while fairly large, was of course centered in Germany and the demand in the United States was rather small owing to the fact that finished dyes were then imported into this country in place of being manufactured here. During the war imported dyestuffs dropped off considerably and, therefore, the Government took steps through the Bureau of Chemistry to investigate the manufacture of dyestuffs, starting with raw materials. This work was carried on extensively by the Color Laboratory under the direction of Dr. H. D. Gibbs. One of the most important discoveries during this period of research was the process for producing phthalic anhydride by the direct oxidation of naphthalene with air over a catalyst. This discovery was the nucleus for an industry which has grown rapidly since that time, which growth has been largely due to the efforts of several companies toward commercializing this process.

The economy of the new air oxidation process in comparison with the old sulfuric acid and mercury process has lead to the constant lowering of market prices and finally in encouraging the development of new processes for the use of phthalic anhydride. Among the outstanding processes using phthalic anhydride which have been developed in recent years are the manufacture of anthraquinone by the Freidel - Kraft reaction, the manufacture of benzoic acid, the manufacture of dibutylphthalate, diethylphthalate and diamylphthalate, the manufacture of synthetic resins, such as, glyptal and rezyl, the manufacture of phenolphthalein, the manufacture of anthranilic acid, and the manufacture of phthalimide. It might be well here to call attention to what is probably the most important development for the use of phthalic anhydride in the manufacture of dibutylphthalate. The development of the butanol process, bringing the market price of this material to a moderate level has, of course, aided materially in bringing the market price of dibutylphthalate to a point where it could be used as a most important plasticizer for nitrocellulose lacquers. The rapid growth of the lacquer industry is a well known fact and the use of dibutylphthalate has gone hand in hand with the use of lacquers.

In 1917 the production of phthalic anhydride was rather small, the material being produced at that time by the old sulfuric acid and mercury process. In 1918 phthalic anhydride manufactured by the air oxidation process was for the first time put on the market. No special mention was made in the Census for this year of the effect upon the market through the production of this material, although the statistics show that the production amounted to 227,414 pounds, an increase of 88,557 pounds over the preceding year. The average market price for 1918 was $2.85 per pound or a reduction in price from the year 1917 of 32.6 per cent., showing that the new process had its immediate effect upon the market. Year by year, we find that the production increases by leaps and bounds and, at the same time, the market



The rapid growth of the market for phthalic anhydride is reflected in this chart which shows the volume of sales from year to year.

price shows a rapid and steady decrease. In 1922 the production increased to 1,629,182 pounds with an average price of 35 cents per pound; in 1924 the production was 2,787,308 pounds with an average market price of 24 cents per pound; in 1926, 4,379,108 pounds, with an average price of 18 cents per pound; and in 1927, 4,549,820 pounds, with an average price of 17 cents per pound. There are no production figures as yet available for 1928, but a fair estimate will bring this figure close to 6,000,000.

As previously stated, the production of phthalic anhydride by the direct oxidation of naphthalene with air over a catalyst was discovered in 1916 by Dr. H. D. Gibbs and Courtney Conover, resulting in U. S. Patents Nos. 1,284,888 and 1,285,117 and various other patents. As the U. S. Government had a shop right in the Gibbs-Conover patents, it announced a method of co-operation with industrial concerns for the development of the process. A few concerns accepted this proposal and eventually developed the process on a commercial basis, which in turn led to the decrease in price from $4.23 per pound in 1917 to 17 cents per pound in 1927, and an increase in sales from 138,857 pounds in 1917 to 4,549,820 pounds in 1927.

At an average market price of 17 cents per pound, phthalic anhydride is one of the cheapest organic acids available. It might be well for no research organization to overlook this moderate-priced organic acid as the development of new processes for the use of phthalic anhydride in the next ten years bids fair to assume large proportions.

Production of solid soda caustic in Italy rose from 39,500 tons in 1925 to 70,300 tons in 1927, according to the Department of Commerce. This expansion of domestic output is directly reflected in imports, which decreased from 22,300 tons in 1925 to 2,000 tons in 1927, with a further drop indicated for 1928 in imports of only 300 tons the first nine months. Productions of soda ash has likewise risen from 138,300 tons in 1925 to 185,000 tons in 1927, while imports of soda ash by Italy are now negligible.

Commonwealth Tariff Board Australia, decides that the following items for the manufacture of cellulose enamels and lacquers may be imported under security in accordance with Item 404 of the Tariff Act: Cyclohexanol acetate, diacetone alcohol, ethylene glycol, glycol mono butyl acetate, glycol mono ethyl acetate, glycol mono methyl acetate, methyl cyclohexanol and methyl cyclohexanone, glycol mono butyl ether, glycol mono ethyl ether, glycol mono methyl ether.

Imports of aniline oil into Japan have declined sharply from 1,255,487 kin in 1926, to 561,818 kin in 1927 and 51 kin in the first 11 months of 1928. Most of this material was formerly imported from the United States. The remarkable decline is due to the large production of aniline oil by the Mitsui Mining Co. and the Nihon Senryo K. K. since the middle of 1927.

By-products coke plant is planned for the South Wales coal field by British Benzol and Coal Installation Co. It will consist of 35 high-temperature coke-ovens, with a by-product rectifier, which will extract ammonium sulfate, benzol, tar products and gas, together with high quality coke.

British Company Cites American Competition in Annual Report

Borax Consolidated state in their report for the year ended September 30, 1928, that the reason for a reduction in profit from £320,738 to £307,188, is continued active competition from the United States. As the result of the competition referred to, the average prices of the company's products were the lowest recorded.

In his report, the Rt. Hon. the Earl of Leven and Melville, chairman of the board, said, "I reported to you at our last meeting that we were developing on one of our properties in Southern California a new borate mineral which would be more economical for the purpose of borax production than the minerals we had hitherto worked. We have during the year done a large amount of development work and have proved the existence of a very large body of this ore on our property. The use of it at our refineries in the United States and in Europe has enabled us to show a profit this year which we should probably not otherwise have made in face of the competition which we have had to meet from various sources in the United States of America.

"The competition does not arise from one source alone, but from several, operating in different ways. The largest and most important is that of an American company operating in California, producing potash from lake brines and also borax in the proportion of about one ton of borax to two tons of potash. The borax being produced as part of the operations has to be forced on to the market. This, with the competition from other United States of America sources, has led to a disastrous reduction in the price of both borax and of boric acid, the market being flooded with more than it can at present absorb.

"So far as potash is concerned, the European producers have, so far, not met this potash competition by a reduction in price, as the production of potash at present in the United States supplies only about 20 per cent. of the consumption there. How long these conditions will last will presumably depend upon the development of potash production in the States and the necessity for the European producers to lower their price to meet the changed conditions. It appears probable that a large increase of potash production in the United States may take place in the near future.

"So far as Searles Lake, where the potash I refer to is being produced, is concerned, we have a large patented or freehold property on the Lake and have the right to work the brine free of roylaty for the production of potash and by-products. During the war we did a large amount of experimental work for the production of potash, but at that time processes were not sufficiently developed to enable this to be done at a profit, especially as we then did not aim at producing any by-products. The matter, however, is receiving now our most careful attention.

"So far as our new mineral is concerned, this is the most economical ore we have yet developed for the manufacture of borax, but it has also great possibilities in other directions for use in various industries, especially in a concentrated form. There have been some difficulties in treating it, but these have been overcome."

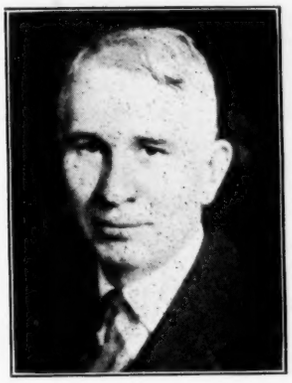
Fertilizers imported into Japan during 1928 were valued at yen 159,000,000, a decline in value of yen 6,346,000 from 1927. Decline was caused chiefly by drop in value of soy bean cake imported. Only yen 93,362,000 was imported during 1928, a decline of yen 15,074,000 from 1927. Ammonium sulfate showed an increase of yen 4,221,000, the imports for 1928 amounting to yen 36,902,000 during 1928.

Imports of Chilean nitrate into Japan are now controlled by the Mitsui and Mitsubishi companies, the former having undertaken to handle a yearly minimum of 90,000 tons of low percentage, and the latter 20,000 tons of high percentage.

FERTILIZERS *of the* FUTURE

By W. S. Landis*
Vice-President, American Cyanamid Co.

TO-DAY it is the most common knowledge that seeds reproduce themselves when planted in cultivated soil. We learn quite early in life that the plant draws food from the soil, and the soil soon becomes exhausted if such food elements are not replaced. Around this has grown our practice of manuring or fertilization. Let us for a moment get a clear understanding of these terms. The word "manure" is the older. It once had a much wider significance than it possesses to-day. Originally it meant "to work by hand" and much later acquired more restricted meaning of "a material or process for the betterment of the soil." It was not until the 17th or 18th century that further limitation of meaning took place, and its use became generally restricted to materials used in such betterment of soils. At first even in its most narrow of the above senses it included chalk, gypsum and lime as well as what we now call "farmyard manures." We now apply it to this last named material alone.



"The dream of concentrated synthetic foods of the human race will be realized first indirectly through supplying a similar material to the soil and letting nature carry on an intermediate transformation."

The term "fertilizer" is of comparatively recent origin. In general it is applied to materials which were presumed directly to feed the plant, in contra-distinction to the "manure" which only indirectly fed it. Nitrates, ammonia salts, phosphates and potash salts were believed to be better classed under this newer term "fertilizer." But the end of such re-classification is not yet in sight, for within the past year the manufactures of the common chemical or commercial fertilizers have objected to the use of the term "fertilizer" to their products and are advocating instead "plant foods."

On the subject of agronomy which includes that branch of agriculture devoted to the growing of the crops and in particular grains, fruits and vegetables, we still have a great deal to learn of the fundamental and underlying facts of plant feeding. We know that seeds when planted upon certain types of soils will under favorable climatic conditions reproduce themselves many fold. We also know that when this same operation is repeated a number of times on the same plot of ground the successive yields become less and less and finally seem to reach a certain fairly definitely fixed minimum of return. We can improve the return by using better seeds and there has been marked progress made in seed development. By rotation of crops, that is, the successive planting of seeds of different families, the decrease of productivity can be halted to a marked extent. By the use of addition agents to the soil crop yields can be maintained or even improved. Knowledge of the use of such addition agents goes back probably to the very early days of agriculture. The use of animal excrements dates before the dawn of recorded history. The earliest writings of the Romans mention the value of dung, of which Virgil sung. Varro and Columella, the earliest agricultural writers, mention not only the use of farm manure but of marl, and spoke of the effect of green manures upon the succeeding wheat crop.

There seems to have been a gap left in the literature of fertilization during the Dark Ages and it was not until the Renaissance that writings upon agriculture became common. There was no mystery in the use of farmyard manure, marl, lime and ashes for promoting crop growth. Just when the Indians of New England learned to place the fish in the corn hill is not recorded. Undoubtedly all of these early fertilizers and manures were accidental discoveries.

The first real scientific basis of our modern practice dates back to the great chemist Liebig, approximately ninety years ago. Liebig probably originated very little but reduced the great mass of experience of his predecessors to an exact quantitative basis. His careful analysis of the constitution of the growing plant showing that 95 per cent of the dry matter of the plant was derived from the atmosphere and only two or three per cent was drawn from the mineral constituents of the soil, threw an entirely new light upon plant feeding. His early work was followed immediately by comprehensive experimental work, the most noted of the early beginnings being that of Sir Joseph Bennett Lawes who began systematic experiments on the family estate at Rothamsted, which estate is now our most celebrated Agricultural Experiment Station.

*Address before American Institute of the City of New York, March 12, 1929.

What we now consider as most typical of our fertilizer materials did not, however, originate with Liebig. As early as 1653 English publications showed the value of rags, wool, bones, horn and wood ashes. A few years later blood, hair, feathers, hoofs, skin, fish, malt, were added. Twenty-five years later the value of nitre or saltpeter as a fertilizer material was recorded. Fifty years later soot and wood ashes, oil cake, and grain dust were added to the list. It was during the Nineteenth Century and probably contemperaneous with Liebig's work that the greatest developments took place. Chile nitrate and Peruvian guano were imported into Europe for agricultural purposes. Practically at the same time, 1842, the first superphosphate patents were taken out, and a year or two later superphosphates began to appear on the market.

The potash salts were added to the list in 1860 with the opening up of the Stassfurt beds. At about the time that nitrate first came into the European market, sulfate of ammonia also appeared in quantity and was tried in agriculture.

Liebig's analytical work confirmed the presence of nitrogen, phosphate and potash in appreciable quantity in the living plant. The early fertilizers and in fact most of those compounded even to-day base their principal value upon these three ingredients. Our knowledge, however, of the constitution of the plant shows that it contains practically every known element, some, it is true, in extremely minute quantity. The soil itself is an extremely complex material. Most of the elements found in the plant are derived from it, for the living plant draws little besides carbon and nitrogen from the atmosphere and very little of the latter directly.

Plant Foods and Plant Stimulants

It is probably unwise to take the broad viewpoint that a fertilizer is any material which is added to the soil to increase plant growth and crop yield. Such definition is too comprehensive. An increase of yield may be due to one or more of several factors. Growth may be promoted by feeding, in which case our fertilizer should contain the necessary elements which when absorbed by the plant promote growth. Nitrogen, potash, phosphate, manganese, zinc, vanadium, titanium and a host of other elements would come under this class.

We recognize that bacterial action plays an important part in rendering soil constituents available for absorption and conversion by the plant. Bacteria are rather particular about the kind and conditions of their surroundings. If we can promote the development of bacteria which in turn converts our soil constituents into more available foods, we usually obtain response in growth. We may, therefore, add to the soil conditioners such as lime, and bacterial foods such as manures and organic matter which promote the development of these colonies of valuable assistants. Such materials would not necessarily come under the class of plant foods but rather as conditioning agents or bacterial foods.

Of recent years we recognize still a third method of increasing plant growth which we class as seed stimulation. We are not so clear as to the function of this group of materials but apparently they act much in the same way as the tonic which the physician gives us when we are not quite up to par. In general the seed itself is treated with these reagents, resulting in a quicker sprouting and more elaborate development of root structure and a material increase in growth and yield. Here again we have crop improvement without the addition of a plant food or soil conditioning agent. It is more a stimulating effect forcing the sprout to develop an abnormal root structure capable of picking up from the soil a correspondingly increased quantity of latent plant food. In view of the complexity of these three very widely different phenomena I am inclined toward the present tendency to drop the word "fertilizer" as applied to our commercial product containing nitrogen, potash and phosphate and use instead the more descriptive term "plant food."

Present Day Plant Foods

The practice of preparing and using artificial fertilizers differs in various parts of the world just as general agricultural practice differs. In some localities the individual materials which the farmer has determined most suitable to his needs are purchased and applied singly to the soil. This practice received its highest development in Europe and persisted up to recently, with at present showing a tendency to a change to the practice of using a compounded or mixed fertilizer. In the United States our practice has been the reverse and the plant foods have been assembled and mixed at a centralized factory, and one application is made of the composite material. Even here there has been a tendency to buy the ingredients and assemble them on the farm but it is probable that we will see a return to the older practice with the advent of the newer fertilizers. The choice is largely a question of availability which in most cases means cost of labor.

Liebig's work demonstrated that nitrogen, phosphorus and potassium were the most important constituents of the plant structure that of necessity had to be supplied to the ordinary soil to maintain the crop yield. Soda, lime and silica while important constituents are present in sufficient quantity in the usual soil as to present no problem of exhaustion. In view of the very wide variation of cultivated soils throughout the world it must be remembered that there are always some exceptions to any such general statement. Upon this foundation our fertilizer practice arose. Such materials as nitrate of soda and sulfate of ammonia being available in quantity formed the nitrogenous portion; mineral phosphates found in various parts of the world by suitable chemical treatment could be rendered soluble and the processing of

these materials took care of the phosphorus requirements; the discovery of the potash salts in Germany, and later in France, Poland and Spain formed the basis of the potash constituent. In addition there have been vast quantities of otherwise wasted products such as refuse from the slaughter house, oil cakes and meals from the oil factories, hair, wool and leather scrap from various sources all of which contain valuable plant foods in more or less available form or if unavailable can be simply processed to make them acceptable fertilizer materials. In the case of certain slaughter house products and oil meal cakes, these products which years ago found their only outlet in the fertilizer industry have now found application as stock foods and vast quantities have been diverted from the fertilizer to the feeding industry.

The fertilizer industry has in consequence come to depend more and more upon chemical products for its raw materials. The natural nitrate of soda and the by-product sulfate of ammonia to which have been added to more recent years various synthetic nitrogen chemical products, such as cyanamid, nitrate of lime, urea, and ammonium phosphoric, now form the bulk of our nitrogenous ingredient. There is little chance of return to the waste organics, and with better education of our farmers the little still used will further decrease.

The phosphate industry still relies largely upon the natural deposits of phosphate rock for its raw material; processed with sulfuric acid this has appeared upon the world markets as superphosphate. Processed with phosphoric acid a more concentrated form of soluble phosphate has been produced but up to the present the quantity of the latter used is only a small fraction of the former. Within quite recent years the raw phosphate rock has been used for the production of phosphoric acid either by chemical or electrothermal processes and this phosphoric acid has been treated with ammonia or potash to form the corresponding phosphate salt.

There has been little or no change in the potash industry which since its inception has turned out various grades of chloride of potash or sulfate of potash.

The American Mixed Fertilizer

Here in America where labor costs are high and extensive farming is practiced, it has been customary to supply to the farmer the three important plant foods in a compounded or mixed form. The processing may be simple or complex depending upon the raw materials used in the preparation of these fertilizers. In its simplest form it consists of a more mechanical mixing of various purchased ingredients to meet a definite formula. In its more complex form less available nitrogenous materials undergo a chemical processing, usually in the presence of phosphate rock, and forming a semi-manufactured material. This in turn is mechanically mixed with other raw materials to form the complete fertilizer.

These American mixed fertilizers contained as little as 10 per cent of the plant foods, ammonia, phosphoric anhydride and potassium oxide, which are the chemical names for the more common designation, ammonia, phosphoric acid and potash. Most of such low grade products have been legislated out of existence within recent years and very few fertilizers that appear on the American market contain less than 12 per cent of the plant foods, ammonia, phosphoric acid and potash. The tendency to-day is to produce materials running from 14 to 16 per cent of these ingredients in the bulk of the fertilizers turned out.

Quite recently there has appeared on the market the so-called double strength or double formula fertilizers containing from 20 to 30 per cent of plant foods.

Balanced Plant Foods

This American practice of mixing the important plant foods together in a factory and selling the resultant mixture to the farmer, had long been frowned upon by the European agriculturist. The basis of his criticism was that this system was forcing the farmer to purchase materials which he really may not require, and that a better principle was to analyze the soil, determining the lacking plant foods, and then supply only such deficiencies. No objection can be taken to the theory behind such a procedure but in practice it did not always successfully work out. The taking of accurate soil samples is a complicated procedure. The analysis is long and tedious. The interpretation of results is very difficult. A high pressure salesman falling upon the farmer at purchase time forced the sale of his single ingredient, and for one of several reasons the farmer usually bought a most unbalanced fertilizer. Now the plant is not able to substitute to an unlimited extent one plant food for another. If a surplus of nitrogen is present a plant thrives only to the extent of the most deficient of the other important foods, as for example phosphate or potash. It avails very little to supply large quantities of nitrogen without adequate amounts of phosphate and potash. At the close of the war there were in existence in Europe enormous factories built during the war for the supply of nitrogen for munitions. At the close of the war these plants turned to the production of fertilizer nitrogen salts and forced their product upon the home markets with the result that there was only a temporary increase in food production, and crop yields gradually dropped off in spite of the continued enormous consumption of nitrogen. A comprehensive study of the situation showed the trouble to lie largely in deficiency of one or more of the other plant foods, and a complete change of manufacturing program was embarked upon with the object of producing a complete fertilizer containing the three plant foods balanced at least to the extent of insuring a fair crop yield. In other words Europe to-day is adopting at least in principle the old established American practice of furnishing the farmer a mixture of the

three important plant foods in proportions to insure at least fair crop returns.

New Fertilizers

As mentioned above the fertilizer industry, more particularly in this country, developed first around a practice of using a great mass of waste materials. Most of such materials are of comparatively low analysis and when they contained any quantity of nitrogen, such as the better grades of cotton seed meal, animal tankage, fish scrap and the like, they found their way into the feeding industry leaving only the lowest grades for fertilizer. As a result of this use of very low grade, or more properly speaking low analysis materials, the mixed fertilizer produced contained a comparatively small amount of plant food. Twenty years ago we began to extract nitrogen from the atmosphere and convert it into chemical products and to-day more of such so-called synthetic nitrogen is produced than comes from the by-product coke-oven and the nitrate fields of Chile. Most of the synthetic nitrogenous compounds produced are of comparatively high analysis. The processes of production themselves are rather flexible enabling one to obtain the chemically combined nitrogen in several concentrated forms. There is a widely diversified field into which the primary products of these fixation processes can be diverted. It has, therefore, appeared logical to maintain the concentrated characteristics of these new synthetic compounds and with them to produce much more concentrated fertilizer. As a consequence there are on the markets to-day complete fertilizers containing 40 per cent and upwards of the three plant foods. The whole fertilizer world is actively engaged in research along these lines and we may expect in the future to find still further new combinations lending themselves to the production of these concentrated or high analysis products. In general these materials are of the types of ammonium nitrate, ammonium phosphate, potassium phosphate, potassium nitrate and like combinations. The underlying principle is to eliminate so far as possible the non-plant food ingredients.

Distribution Problems

The distribution of fertilizer is quite a problem. The various products formerly used came from widely different sources. They were assembled in mixing plants, bagged, tagged and guaranteed as to content and then transported to the farm centers. Further transport to the farms was then required and finally distribution in the fields. The costs of assembling, bagging and transportation to the farm centers in many cases equalled the wholesale value of the plant foods contained, so that the practice was not particularly economical in the case of the low grade materials. The actual costs of field distribution alone formed a very appreciable item where the material contained only 15 or 10 per cent of plant foods. With the advent of the higher grade materials analyzing three or four times as concentrated as the older types, these distribution costs could be cut materially. From the economical standpoint there is, therefore, a marked advantage in increasing concentration of the fertilizers.

Application of Old Fertilizers

The older fertilizer made up very largely of a slightly soluble phosphate mixed with the insoluble organic nitrogenous materials and with only a modest quantity of soluble salts, offered no great problem in field application. The minimum of care and the use of the most crude equipment enabled the farmer to avoid damage or burn. The new high analysis fertilizers, however, are essentially water soluble materials. Their application, if injury to the growing plant is to be prevented, requires more care and in particular a more thorough incorporation with the soil before or during seeding. They must be located more carefully with respect to the seed. The economical quantities used are much smaller than with the low analysis materials, and require equipment capable of finer adjustment. None of these problems, however, are insurmountable and my staff has planted hundreds of plots over the past three years with fertilizers containing as much as 60 per cent of plant food and all in water soluble form, and using the better standard grades of available farm equipment without difficulty or damage.

There is still another phase of the new fertilizer situation which is now commanding our best attention. I mentioned early in my address the fact that careful analysis of the plant showed it to contain a very wide variety of elements and it is believed that

Potatoes grown without fertilizer, such as those indicated in this picture, show poor growth and slim yield as compared with those aided by fertilizer.

most of these play a vital part in the growing plant. In the old days most of the waste products used were of plant or animal origin and contained many of these essential elements. Phosphate rock itself is a most complex material and in the process of manufacturing superphosphate the whole of the rock appeared in the superphosphate, so that fertilizers compounded of these materials contained most of these vital elements

even though in extremely minute quantity. Many of the newer fertilizers are crystallized products, that is chemical products crystallized from solution and in the process of crystallization are purified or freed from contaminating elements. The disappearance of the organic wastes from our fertilizer materials leaves out another source of supply of some of these rarer elements. In consequence the agronomist is now faced with a new problem and must be on the eternal lookout for elemental deficiencies of more or less unsuspected nature. I have in mind the case of the Florida soil which refused to produce tomatoes until a small quantity of manganese was added. I also have in mind two other cases where zinc in one and titanium in the other were necessary to successful agriculture. I believe, therefore, that we are opening up a new field of investigation of the influences of new elements, which influence has not been felt due to the older fertilizer practice, but which may show up in a substantial manner in the case of some of the new fertilizers such as are being produced in Europe. It is a subject to which some of us are paying the closest attention.

Summing up, the future fertilizers will be much more concentrated in the three common plant foods than even past history would lead one to suppose. The older organics of animal or vegetable origin will disappear to still greater extent and will be replaced by newer synthetic salts mostly of inorganic nature. There is no particular advantage from the agricultural standpoint in these organics and the newer products will produce equally good or better results. Education of the farmer in the use of the newer synthetic products will decrease the demand for the organics to that point where they sell at an equally competitive price.

The potatoes in this picture, grown under the same conditions as those shown on the opposite page, but treated with a suitable mixed fertilizer, yield from 75 to 100 bushels per acre more as a result.

There will be a material change in the character of the inorganic fertilizer materials and those showing tendency to deflocculate soils, others showing tendency to leave harmful residues in the soil, and those of inferior physical characteristics will disappear and be replaced by greatly improved combinations. There will be many new elements added to the list of essential plant foods. Process limitations existant to-day will disappear in so far as they eliminate essential plant foods, and the science of compounding will be greatly elaborated as we acquire better knowledge of plant requirements and soil deficiencies.

The dream of the concentrated synthetic foods of the human race will be realized first indirectly through supplying a similar material to the soil and letting nature carry on an intermediate transformation.

The Industry's Bookshelf

Identification and Properties of the Common Metals and Non-Metals, by J. E. Belcher and J. C. Colbert, 246 pages, The Century Co., New York, $1.75 net.

A manual of forty-five experiments, following the sequence of topics as discussed in Smith-Kendall's General Chemistry and continuing the work covered in the authors' earlier book, "Experiments and Problems for College Chemistry."

Gas Chemists Handbook, 800 pages, American Gas Association, New York, $7.00 net.

The third edition, completely modernized and brought up to date, of this very technical, very complete guide for the gas chemist.

Mergers and the Law, 153 pages, National Industrial Conference Board, Inc., New York, $3.00 net.

One of the series of studies of public policy in the regulation and control of business organization and methods. This one traces the development of public policy toward corporate consolidations.

The Economics of Coal Mining, by Robert W. Dron, 168 pages, Longmans, Green & Co., New York, $4.20 net.

A review of the various practical economic problems which are encountered by all those associated with the working of mines, including legal and financial factors which must be included.

An Etymological Dictionary of Chemistry and Mineralogy, by Dorothy Bailey and Kenneth C. Bailey, 307 pages, Longmans, Green & Co., New York, $10.00 net.

An interesting dictionary providing those who are interested with the derivation of chemical and mineralogical names. References are given to the sources of the derivations.

Sales Management Fundamentals, by Richard C. Hay, 249 pages, Harper & Brothers, New York, $3.50 net.

Covers the high points in the fundamentals of sales management in a common-sense and practical statement by a man with a conspicuous record of success as a sales manager.

Introductory Theoretical Chemistry, by G. H. Cartledge, 550 pages, Ginn & Co., New York, $3.60 net.

A textbook of theoretical chemistry which achieves a logical and approachable treatment through successive discussions of matter, solutions and reactions, with a final section for the application of the principles involved.

Electrical Engineering and Electrochemistry, edited by Alfred Scholman, 1304 pages, Technische Worterbucher-Verlag G. M. B. H., Berlin.

This is volume 11 of a series of Illustrated Technical Dictionaries. It is in six languages and contains about 4,000 illustrations and numerous formulae.

Solving Sales Problems With Economic Research

By T. K. Urdahl

Rule-of-thumb methods have long since been discarded in the technical end of chemical production. But changing marketing conditions have not generally been met with the same open-mindedness towards new methods. Nevertheless economic research is keeping pace with scientific research, and if an adequate balance is to be struck between supply and demand to avoid the evils of overproduction, this aide to selling should be enlisted in helping solve our pressing chemical distribution problem.

DEMAND for any commodity is an extremely complicated and uncertain quantity. Every company acts as an intermediary between the desires or wants of the masses and raw materials that may be transformed to want-satisfying commodities. Its success depends in a large measure upon its ability to anticipate the wants of the public and create the goods that will satisfy them before the wants occur.

Many a business man still regards his company as all important and the wants to which the business caters as of secondary significance. Such business men still use their intuitive method of determining their business policies. Nearly everyone has progressed beyond the rule-of-thumb methods in the technical end of production but many still rely on such methods in marketing their products.

One of the first effects of mercantile research when efficiently carried on is greatly to reduce the number of styles or classes of products offered for sale. The great European Chemical Combine, which includes the chemical trusts of Germany, France, Belgium, Luxomburg and the Franco-German Potash Syndicate eliminated two thirds of the products manufactured and offered for sale before the War. The New England shoe manufacturers reduced and simplified the number of styles in the same manner resulting in huge economies of production and distribution.

Many successful corporations, who have engaged in business for a long time gradually adopt the idea that they are dominant institutions and assume the "public be damned" attitude. They are imbued with the idea that the public will have to take what they offer or do without. When this policy is maintained the company is in a very serious condition, for no corporation can in the long run go contrary to public demand, no matter how strong it may have been in the past.

A market survey will, if properly made, enable the company to adjust its activities to meet the needs of the public and in many cases mold public opinion so that a demand may be created for goods already produced. Every problem of every firm shows in its last analysis, a marketing aspect. This resolves itself into two distinct problems, first—what kinds of goods does the market want, and second—how shall the industry proceed to satisfy this demand.

The survey may in addition show specific results such as a possible change in the method of reaching the market or a change of products more acceptable to the market. The first of these may develop a sales-campaign or a new advertising campaign.

Many persons still think of a market as a place where things are bought and sold and generally think of some specific place where buyers and sellers meet and make exchanges. As examples they think of the produce exchanges, the Elgin Butter Market, the Stock Exchanges and many similar institutions. A more careful analysis reveals the fact that these exchanges are but a small part of the real markets in question.

Markets to-day mean the areas within which the forces of supply and demand for a commodity are effective. There is a world market for wheat, cotton, coffee, and wool and there is an American market for American flags, college pennants, ready made clothes and thousands of other commodities.

Furthermore, there are many local markets where demand and supply interact within still narrower boundaries. Delving still deeper we find that the markets for different commodities are dependent on each other and interact. The market for corn is affected by the market for wheat. The cotton market reacts on the wool market and yet the cotton market is determined by many factors that do not affect wool.

A complete survey of the elements constituting any market are to-day so multitudinous and complicated that the generally accepted formulas based on inspection and guesswork are no longer satisfactory. A scientific market survey will furnish definite accurate information as to the nature, character and

location of the consumers of a given product and enables the producers to secure a first hand definite understanding of the present markets by analyzing the actual concerns, the location, numerical strength, purchasing power, buying motives, likes and dislikes of the customers. It makes possible the discovery of new markets. It often leads to the discovery of a potential market for a by-product of the industry. It enables a company to realize just how it stands in competition with others in the same field.

A great deal of information which business men often accept at its face value is often misleading and erroneous. During the War it was generally believed by leaders in the tanning industry that a certain large concern controlled from 85 to 90% of the output of some kinds of leather. An intensive investigation revealed the fact that it really controlled only about 35% of the output in question. Those who accepted the 85% estimate relied on hearsay evidence without any foundation of fact.

Mistaken Estimates Hurt Business

Mistaken estimates which may be unimportant in academic discussion are very serious when questions of business policy are based upon them. Every producer, whether large or small needs to know these facts in order to manage his business properly. Commercial research is really at bottom fact finding research establishing definite information instead of uncertain estimates and guesswork.

In most lines of production industry is to-day operating at less than 65% of its capacity. For years the steel industry has found that the market could take care of less than 65% of its capacity and it has adjusted its production as a result of careful research to this quota.

Lack of adequate commercial research in many lines of production is probably partially responsible for recurring cycles of overproduction and depression. As soon as the "cycle" is over the average producer is carried away by optimism and instead of adjusting production to the actual needs, pushes his production to higher levels which in the long run leads to another depression.

First, each individual producer may make mistakes in the location of his business, the quantity to be produced, the kind of products, or in the kind of business he should do.

The second type of maladjustment is that of a trade or a line of business taken as a whole. To avoid the dangers of this many trade associations employ commercial research departments of their own, the results of which are available to all the members.

Forty-six industries and trade associations are known to have established commercial and industrial research departments and many others are contemplating the inauguration of such activities in the near future. This fact alone speaks volumes for the importance and efficiency of this new departure in business.

A sales analysis is usually derived from the company's own sales records. Generally, however, it is necessary to acquire a knowledge of economic factors beyond the experience of a single company. In a certain field a group of ten manufacturers regularly exchange statistics showing each company's sales in the different sections of the country. By compiling and analyzing these figures it is possible to determine what parts of the country are weak or strong.

These statistics may be charted and establish in a clearcut way the competitive sales position of the company in question. Through advance information of this kind it is often possible to reduce or adjust production to sales, thus reducing the inventory.

One progressive concern has been able to stabilize its production and reduce materially the amount of unemployment during periods of depression by increasing its advertising and pushing sales during the lean years.

Commercial research as a basis of export trade is a comparatively recent development in the United States. The great trading nations of the world have been carrying on this work for many years. Even Great Britain, which has been the most individualistic country in Europe, is rapidly changing its policy to one of close co-operation. The British Board of Trade has been transformed into an active aggressive organization and is carrying on research activities in the great markets of the world. Pouring its great flood of trade information into a great central reservoir, it engages in classification and organization so as to make it available for the British manufacturers and merchants. British trade is being reorganized along scientific lines and is to-day better equipped than ever before to meet the fierce competition of other countries for control over world markets.

German Marketing Research

Germany, even before the Great War, had evolved a system of research departments in connection with its factories and commercial establishments. German agents were sent to all the great markets of the world to collect facts and send them back to the merchant or manufacturer who employed them. Credit risks were analyzed, buying habits studied, personal connections of buying concerns and the kinds of products needed, were all analyzed and utilized. Germany was thus able to cater successfully to the whims and fancies of primitive people as well as to those of the more advanced nations of the world.

Even during the War, the German government created the Iron and Steel Institute, a research organization for promoting foreign trade. It also founded the Institute for Chemical Research. All the research organizations were concentrated in the Imperial Economic office.

France has also been awakened to the need of business research and has sent out investigators to study markets and bring back reports. Even Japan has started a scheme for carrying on commercial

research in order to provide Japanese manufacturers and merchants with information that will aid in selling their goods in all the countries of the world. The South American countries are deeply interested in the new movement and have established agencies for carrying it on. Peru has created a Commercial Information Bureau to enable its industries to get into contact with the markets in which they buy and sell their goods.

Before the war most of the American exports were largely handled by international merchants or export houses generally managed by Englishmen, Germans or other nationals. These managers were usually interested in pushing the wares of their own country rather than American goods. Gradually the great industrial combinations of the United States established their own selling organization and expanded their business through effective economic research.

Promoting American Foreign Trade

In order to promote foreign trade of the United States it is necessary to enlarge the activities in this field following the very effective foreign trade activities of the German industries. American methods of advertising and salesmanship are not as effective in world markets as at home. The American exporter must have more accurate and more complete information of the wants and customs of foreign buyers if he is to succeed in competition with English, German or French producers. Here commercial research is of greatest importance, for without it American industries have no chance in competition with the highly organized and effective exporting machines of their rivals. To succeed, Americans must learn to cooperate, to pool their facts and use modern, up-to-date methods of interpretation.

The old individualistic method of doing business, so dear to the average American business man, is rapidly being discarded, just as antiquated methods within the factory are given up for more efficient practices. As Herbert Hoover has tersely expressed it "we are, almost unnoticed in the midst of a great revolution, or perhaps a better word, a transformation of the whole super organization of our economic life. We are passing from a period of extremely individualistic action, into a period of associational activities."

Natural soda deposits discovered on Lake Tanatar in Slavgorod district of southwestern Siberia, have been estimated at 100,000,000 tons, according to official dispatch of the Siberian Government. The thickness of the bed is said to be about three meters. The composition or purity of the deposit are not known. Since Russia is said to consume 200,000 tons of soda annually, it is expected that her present import requirements of about 50,000 tons will be provided by this domestic source.

Belgium consumed 129,855 tons of Chilean nitrate during 1928, nearly double the 1927 figure. A large cyanamide plant in Ghent will commence operations in April, marking the first production of this article in Belgium. The enterprise is fostered by the Societe Anonyme d'Ougree-Marihaye and the Societe General de Belgique bank, with the Boerenbond Belge, a cooperative organization, contracting for the output.

Science and Sales

Attention is called to the fact that German dry color plants have found it advantageous to use magnetic oxide of iron, obtained as a by-product in the manufacture of aniline or alphanaphthylamine, as a cheap raw material in the process. A brown colored oxide is produced of poor covering power. *Chemiker Zeitung, 1928, 846-7.*

A new form of casein, which is capable of swelling, is made by mixing with it a ten per cent. solution of dextrin or a degradation product of starch. The mixture is dried and ground. *German Patent No. 4,451,732.*

A mixture of barium carbonate and calcium hydroxide is added to water in order to soften it. *U. S. Patent No. 1,689,036.*

Both disodium hydrogen phosphate and sodium bicarbonate are used in suitable proportions for treating water in order to reduce its high content of lime and magnesia. *French Patent No. 624,101.*

Another water softening composition contains zinc chloride or zinc sulfate and extract of logwood. *French Patent No. 623,440.*

Hexylresorcinol is used as a germicide in admixture with glycerine. *British Patent No. 299,522.*

New solvents and plasticizers for nitrocellulose, cellulose acetate and various cellulose esters and ethers are the alkyl esters of maleic and fumaric acid, such as ethyl maleate, methyl fumarate and the like. *U. S. Patent No. 1,677,753.*

Where the addition of the chemical does not spoil the acid for a use to which it is going to be put, considerable advantage is gained from the standpoint of storage and transportation of the acid in steel drums without injury to them, when arsenic trioxide or sodium arsenite is added to the acid. *U. S. Patent No. 1,678,775.*

A new method of dehydrating magnesium chloride consists in passing over it a current of a dry gas containing hydrogen chloride. *French Patent No. 624,738.*

Glass is strengthened by gluing to it a sheet of celluloid and then repeating the process until a built up product is obtained. The use of a proper solvent for the celluloid is important, for the adhesion between the glass and the celluloid must be perfect. Diacetone alcohol, tetrachloroethane and cyclohexanone have been found to be excellent solvents for this purpose. *British Patent No. 299,900.*

A difficulty encountered in pickling metals is pitting. It is claimed that pitting is avoided by the addition of stannous chloride. *U. S. Patent No. 1,678,776.*

Rosin is mixed in suitable proportions with castor oil and the mixture is then hydrogenated. The products obtained are of pasty character and are suitable for use in the manufacture of soap, textile preparations and the like. *German Patent No. 451,180.*

A New Use for MERCURY SALTS

By Hugh Glasgow
New York Agricultural Experiment Station

SINCE its introduction eight or nine years ago as a soil insecticide, mercuric chloride has come to be one of the most useful materials available for combating the root maggots of cruciferous crops.

While the efficiency of mercuric chloride, when applied for this purpose, cannot be questioned, injury to certain crops has occasionally been reported following its use. Mercuric chloride solutions, in the proportion generally recommended, are safe and effective; but they must be used with care, and it must be admitted that the margin of safety for such tender crops as cauliflower seedlings is not very great even when the dosage is cut down to the minimum.

On this account it seemed worth while, if possible, to find some compound of mercury that would be less toxic to the plant but that would still retain the valuable insecticide properties of mercuric chloride.

With this object in mind a systematic examination of the different available compounds of mercury was planned. Of the compounds so far studied during the past three seasons, mercurous chloride has given the most promise of fulfilling these requirements. For the present, therefore, the discussion will be limited to a consideration of the merits of this compound as compared with the standard dilutions of mercuric chloride as commonly recommended.

Mercurous chloride, calomel, or mild mercuric chloride, as it is sometimes termed by the dealer, is a heavy, white powder practically insoluble in water, and generally regarded as an exceedingly inert substance. For this reason it was tested in the regular course of the work more as a matter of routine, as nothing much was expected from it as an insecticide.

Preliminary tests soon suggested, however, that this apparently inert compound really did possess surprising insecticidal properties when placed in the soil, and this was borne out by later detailed tests on a number of different insect pests. In fact it was found possible with this material to secure more definite and complete control of pests such as the cabbage maggot, onion maggot, and carrot rust fly than with any of the other insecticides available. This was due chiefly to the fact that on account of its extreme safety to the plant the dosage could be increased almost without limit, where with most of the other insecticides suitable for this purpose, limits of safety are more sharply defined.

Formerly regarded as an exceedingly inert substance, the possibilities of the use of mercurous chloride as a soil insecticide have hitherto been disregarded. This article describes recent tests at the New York Agricultural Experiment Station which have not only shown calomel to be a very useful insecticide, particularly in the treatment of tender crops, but also to possess considerable fungicidal value in checking seedbed diseases.

In carrying out these tests the mercurous chloride was applied in a number of different ways with the idea of establishing the limits of safety to the plant and its insecticidal properties as well as any possible value it might have as a soil fungicide for use against seedbed diseases.

The usual method of applying was in an aqueous suspension, by first making the required amount into a paste and later adding this to the bulk of the water. When used in this way the proportions arbitrarily taken in most of the routine tests were one ounce, four ounces, and eight ounces respectively to ten gallons of water, the resulting suspensions being constantly agitated as they were applied.

In addition to this method of applying, the mercurous chloride was also used as a four per cent. dust in an inert carrier such as finely powdered gypsum. In this form it was usually drilled along the row directly on the seedlings so that there would be a continuous deposit of the dust on the ground immediately about the base of the plants to be protected.

Finely powdered mercurous chloride has the property of adhering tenaciously to certain smooth coated seeds such as cabbage or cauliflower.

On account of this quality it is possible to coat such seed very thoroly with an exceedingly heavy film of the powder by the simple process of agitating the seed for a short time in a vessel containing finely powdered mercurous chloride. By such a procedure a pound of cauliflower seed should retain somewhat more than half its weight of the powder distributed as a uniform film surrounding the individual seeds.

Seeds of various kinds coated in this way were planted, and as a further check on their tolerance to this material heavy applications of the pure powder were also made at the time of seeding, so that the seed when covered was surrounded by

powder. Even with such an excessively heavy application of the pure mercurous chloride directly to the seed in the soil, the seed of cabbage, cauliflower, radish, onion and a number of other crops were found to germinate normally, the young seedlings pushing thru this deposit of pure mercurous chloride with no apparent injury. In some cases there even appeared to be a noticeable stimulation in the development of the seedlings due possibly to the mercuric chloride inhibiting the growth of injurious soil fungi. Such heavy applications of mercurous chloride to the seed at the time of planting were made at first with the idea of testing the tolerance of the germinating seedlings to the chemical and to establish also the effect of such heavy applications on the development of seedbed diseases. It soon became apparent, however, that when applied in this way and with no subsequent treatment certain crops were protected to a marked degree from the attack of insect pests such as the root maggots and that frequently this protection persisted thruout the remainder of the growing season.

The studies on mercurous chloride so far carried out indicate that this material promises to be an extremely useful insecticide for use against certain types of soil inhabiting insect pests such as the root maggots. The fact that it combines the qualities of great efficiency with almost unlimited safety to the crop treated makes it an insecticide of great promise. This applies particularly to the protection of extremely tender crops, such as cauliflower or celery seedbeds, on which most of the other insecticides available for root-maggot control are likely to cause injury.

In addition to its value as an insecticide, mercurous chloride when applied as for root-maggot control has in some cases shown marked results in checking certain seedbed diseases, notably club-root and damping-off troubles in cabbage and cauliflower seedbeds. Used alone or in combination with mercuric chloride it appears to have great promise in checking such seedbed diseases irrespective of its value in the control of insect pests.

Exports of borax from the United States, amounting to $3,227,000 for first ten months of 1928, are 33 per cent. greater than for the entire year of 1927. Estimates on the full year of 1928 indicate nearly a 60 per cent. increase over 1927. For the first ten months of 1928, $2,773,445 worth has gone to Europe; $298,766 to the Far East; and $145,346 to North and Central America and the West Indies.

Europe and the Far East are the largest consumers of American borax, the North, Central American and West Indies section ranks third, with South America fourth. The largest increases in the purchases of American borax by individual countries estimated for the entire year 1928, are in France 220 per cent., Germany 120 per cent., Italy 142 per cent., Netherlands 30 per cent., United Kingdom 33 per cent., China 1,500 per cent., Hong Kong 500 per cent, the Philippines 54 per cent, and Japan 4 per cent. Those of the principal consumers whose purchases are less for the ten months of 1928 than for the entire year 1927 are Canada, Brazil, and Colombia. However, the estimated total for this group for the entire year 1928 is about equal to 1927 sales. In Mexico and Cuba there are substantial gains.

Who's Who In Chemical Industry

Gerow, C. Culbert, sales manager, Hercules Powder Company. Born, Salisbury Mills, N. Y., 17 Feb. 1880; children, 6; educat., rural schl. Laflin & Rand Powder Co., N. Y. C., 1898-1903; E. I. du Pont de Nemours & Co., Wilmington, Del., 1903-12; Hercules Powder Co., Wilmington, Del., asst. to vice-pres., 1913, sales mgr., 1918 to date. Memb., Amer. Management Assn., Amer. Iron & Steel Inst., Wilmington Chamb. Comm., Wilmington Country Club. Hobby: golf. Address: Hercules Powder Co., Delaware Trust Bldg., Wilmington, Del.

Smith, Frederic J., chief chemist, Phosphate Rock Department, American Agricultural Chemical Co. Born, So. Hadley, Mass., 30 Nov. 1867; mar., Nettie Hapgood Piper, No. Hadley, Mass., 29 Apr. 1899; children, 2 sons, 1 dau.; educat., Hopkins Acad., Hadley, Mass., 1884-86, Mass. Agri. Coll., Amherst, Mass., B. S., 1890, M. S., 1896. Mass. State Bd. of Agri., chem. to Gypsy Moth Com., 1896-99; Bowker Insecticide Co., res. chem., 1899-1908; present pos., 1908 to date. U. S. Patents, insecticides, fungicides, coml. prep. Bordeaux mixt. & dehydration of moist prods. Memb., Amer. Assn. Adv. Sci., Amer. Chem. Soc., Assn. Fla. Phosphate Min. Chem. (pres., 1926-27). Author: "Arsenate of lead, etc. Manufacture & Chemical Composition;" with A. H. Kirkland, "Digestion in the Larvae of the Gypsy Moth." Hobby: amateur tennis. Address: Box 167, Pierce, Polk Co., Fla.

Snow, Roscoe Kent, assistant sales manager, The Dow Chemical Co. Born, Syracuse, N. Y., 12 Apr. 1878; mar., Emily A. Doll, Wilmette, Ill. 25 Sept. 1926, children, 2 sons; educat., high schl., special Pharm. course. C. W. Snow & Co., own retail drug bus., H. K. Mulford Co., The Upjohn Co., The Doll Chem. Co. Nine yrs. Natl. Guard Service in N. Y. Clubs: Saginaw Country, Saginaw Canoe, Midland Country, 32 deg. Mason. Hobbies: golf, music. Address: The Dow Chemical Co., Midland, Mich.

Trubek, Moses, vice-president in charge of production, Franco-American Chemical Works. Born, Riga, Latria, 1868; mar., Fannie Jacobson (dec. 1914), New York, 1895; 2d, Josephine Kells, Wood Ridge, N. J., 1918; children, 6 sons, 1 dau.; educat., Univ. Riga, Latira Ch.E. Wm. Zhan Leather Co., 1892-95; Natl. Provisioner, chem., 1895-99; Leon Godchauae Sugar Refining Co., 1893-99; analyt. consulting chem., N. Y. C., 1899-1900; Franco-Amer. Chem. Wks., 1900 to date. One of the first mfrs. of ethyl chloride on coml. scale. Special designs for the production of organic esters. Sinking Fund & Police Pension Fund Comm., of Borough of Carlstadt, since 1914-16. Chmn. various drives during War. Dir., Carlstadt Mutual Bldg. Loan Assn., Rutherford Natl. Bk., Carlstadt Consumers Ice Co. Memb., Amer. Chem. Soc. (1893), Compressed Gas Mfg. Assn., Bd. Trade (Carlstadt, N. J.), Carlstadt Turnverein (treas. 1914-23), Masonic & Rotary Club, Rutherford. Hobbies: philosophical, historical, geographical studies. Address: Franco-American Chemical Works, Carlstadt, N. J.

Vaughn, Charles F., vice-president and manager Niagara Falls Works, The Mathieson Alkali Works, Inc. Born, Providence, R. I., 1874; mar., Hallie Perkins, Binghamton, N. Y., 1906, educat., Worcester Poly. Inst. B. S., 1896. Mathieson Alkali Wks. and assoc. co's., 1896 to date. Lt. Col., Chem. War. Serv., charge Chlorine sect., Edgewood Arsenal. Tech. work on devel. of Castino Proc. for electrolytic manuf. of caustic soda chlorine, etc. Clubs: Niagara, Univ. (Niagara Falls). Hobbies: small boat sailing, cruising. Address: Mathieson Alkali Wks., Niagara Falls, N. Y.

PLANT SAFETY POLICIES

EXPERIENCE has shown that efficient production requires a competent group of employees, free from personal injuries. The occurrence of accidents hampers operations, demoralizes the organization and interferes with the work of supervisors and men.

Aside from compensation and medical expense, accidents have been found to increase overhead and production costs. Often materials are spoiled, machinery injured or tools damaged. Occasionally, as a result of accidents, orders may not be completed on schedule; machinery may stand idle; or because of the substitution of a less competent man for the injured employee, the quality of the output may be lowered. In cases of permanent disability, time and money are spent training another employee for the job, while in some cases the disabled man is kept at regular wages, although performing less skilled work.

Ability to show a record of high production at low unit cost is considered one mark of a successful foreman. The prevention of personal injuries plays an important part in making such records possible.

The accident records of many companies show that most personal injuries occur because of human failure, largely the inability of individuals to adjust their working habits to the hazards of their particular jobs.

It has been found that the safeguarding of machinery and the removal of physical hazards, although essential as proof of company's willingness to provide safe working conditions, must also be accompanied by the adoption of safer practices on the part of employees and supervisors. This often requires a change of attitude toward the job, involving greater interest in the work and the protection of fellow workers from injury.

With the expansion of industry the foreman is generally recognized as holding the key position, since a competent, productive working force rests largely upon his ability to lead and inspire confidence among those under his direction. In many cases the success of safety work also depends upon his efforts to develop among his men proper interests and attitudes regarding safe working conditions and methods.

Studies of the underlying causes of accidents reveal that the failure of employees to perform their work safely, frequently may be prevented by systematic supervision. In most cases, this demands not only a constant check upon operating methods and conditions, but also a knowledge of men, resourcefulness, tact and careful guidance on the part of the foreman.

Adequate planning and the maintenance of a clean and orderly department serve as incentives for safe and efficient working methods.

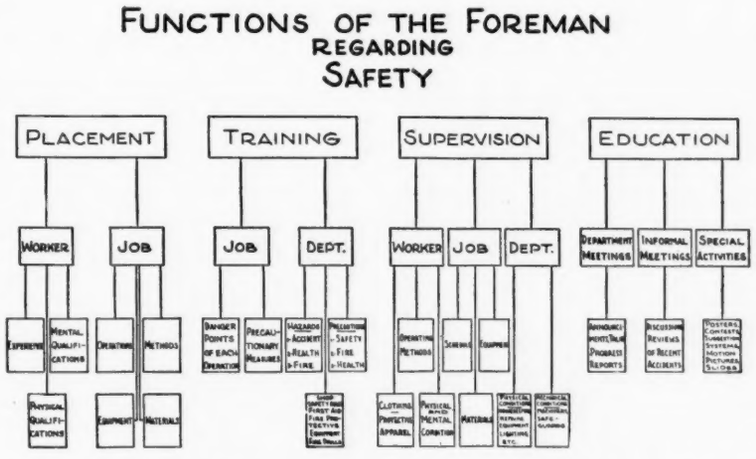
Chance-taking, unnecessary haste, hazardous "short cuts" and other unsafe practices are discouraged by strong leadership, mature judgment and proper example.

A reputation for "square dealing" and a sincere personal interest in men assist the foreman to maintain adequate departmental discipline.

When coupled with proper selection, placement and training of employees and a periodic check of physical and mental fitness, these basis requirements of good foremanship usually make for an efficient, dependable working force, practically free from personal injuries.

A number of industrial have been found to result from the placement of employees at work for which they are unsuited, mentally or physically

Occasionally, the worker is incapable of performing his job safely because of a wrong attitude toward his work, lack of experience, chronic poor judg-



This functional chart and the accompanying article form part of an industrial safety series, prepared by the Metropolitan Life Insurance Co. This particular article dealing with the part played by the foreman is of particular interest to plant executives in determining supervisory policies in securing freedom from accidents.

ment, or ignorance. In some instances, mental disorders such as sluggishness, distraction, excitability or violent temper are important factors in the occurrence of accidents. In others, defective vision or hearing, epilepsy, heart disease, undeveloped hernia or similar physical disability is the underlying cause of personal injuries.

Some companies, besides investigating the employment history of prospective workers, subject them to a physical examination or employ aptitude tests to measure their fitness accurately. This information makes it possible to determine whether the applicant is capable of satisfying the requirements of the job, thus insuring his placement at work for which he is best adapted.

Shop Practice Instructions

In addition to the careful selection and placement of workers, many executives find it profitable to provide a systematic program of instruction regarding safe and efficient shop practice for new employees, as well as for those transferred from other departments.

This is accomplished in some large organizations by the conduct of a training department or apprenticeship school, where employees are taught the requirements of each operation of their work. Others prefer to appoint "instructing foremen," acting under the supervision of department heads. On smaller properties departmental foremen are held accountable for employee training, as a part of their supervisory and managerial duties. In these cases, new or transferred workers are taught by the foreman himself or are placed under the guidance of an experienced employee for a given length of time.

Regardless of the method adopted, fixed responsibility for an adequate program of instruction has proven one of the most effective means of insuring efficient workmanship, free from personal injuries.

Employees and supervisors frequently have been found to lose interest in safety work solely because the management appeared insincere by failing to authorize the correction or removal of hazardous physical or mechanical conditions.

To overcome the tendency of supervisors to neglect safeguarding because of departmental cost, some companies charge expenditures for safety improvements and guarding to a general maintenance account or to a special fund appropriated for the purpose, rather than to the maintenance account of the department in which the improvements are made. This policy usually insures prompt action when corrections are needed, thus convincing employees that the company is sincerely interested in making the plant as physically safe as possible.

The responsibility for determining whether physical improvements or additional guarding is needed in a given department often is placed directly upon the supervisor in charge, acting in co-operation with the Safety Director. The latter records the necessary requirements and encourages officials to provide them promptly.

The attitude of supervisors toward safety is generally considered as the determining factor in the success or failure of accident prevention work. This attitude is directly influenced by superintendents and operating officials, whose repeated indication of the importance attached to accident prevention by the company is highly essential.

Many organizations find it desirable for superintendents to hold monthly or semi-monthly meetings of foremen to acquaint them with problems or changes in policy. Instead of appointing foremen's safety committees or holding special meetings for foremen, accident prevention matters are frequently presented upon these occasions. This serves to maintain continual interest in the subject, as well as to convince supervisors that safety is considered a part of regular operating duties rather than as an additional activity.

When held at regular intervals, it is considered that these meetings afford excellent opportunities for superintendents to keep in close touch with the accident situation and to emphasize repeatedly the safety policies of the company.

Recognition of the growing importance of the foreman's position, with its many and varied responsibilities, recently has led a number of organizations to conduct systematic courses of instruction for supervisors regarding the requirements of successful foremanship.

To provide an opportunity for study and discussion of foremanship problems, as well as for the exchange of opinions and experiences regarding various phases of their jobs, special meetings of the supervisory force are held in some cases by company officials. In others, group conferences, composed of representatives of a number of local industries, are arranged under the auspices of a civic body or influential company. In some communities Foremen's Clubs are organized for a similar purpose. Correspondence courses and text study plans are also employed.

Safety Training Programs

Safety is given a prominent place in some foremanship training programs. Supervisory duties in respect to safety, the effect of accidents upon production costs, causes of accidents, methods of prevention, safeguards or other related subjects are included.

Some organizations promoting effective safety work have deemed it highly desirable for foremen to conduct safety activities among their employees.

A portion of the program of departmental meetings, often called for the purpose of creating mutual interests between supervisors and workers, is devoted to safety. A short instructive talk is given by a foreman, superintendent or operating official; the department's accident experience or relative standing is reviewed and causes and remedies of

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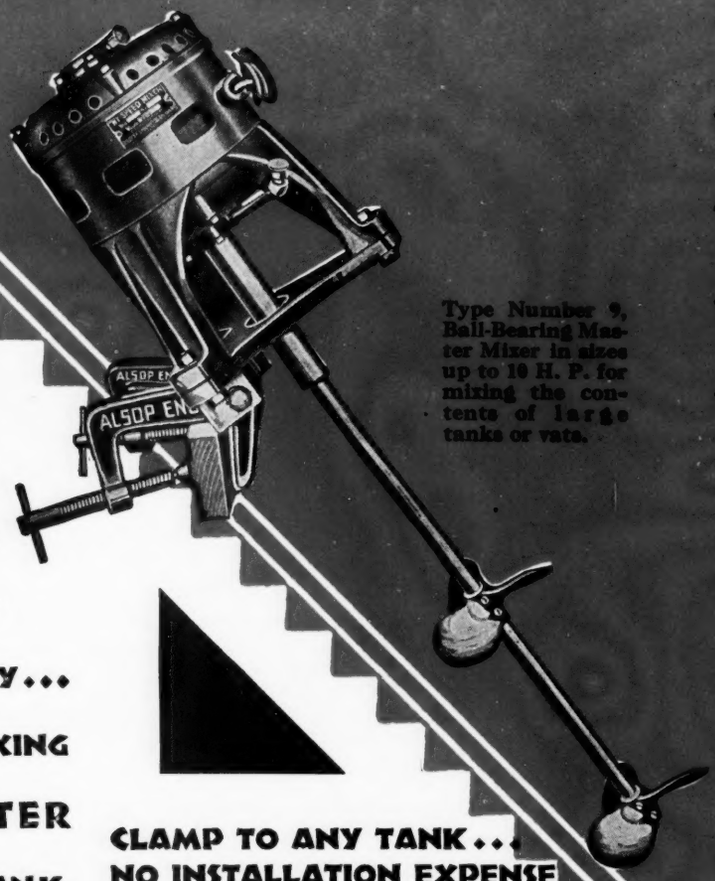

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47 West 63rd St.
NEW YORK CITY

INCO MONEL METAL

serious accidents are discussed, followed by suggestions for increasing the scope of the department's safety work.

Informal, short meetings of the foreman with his men provide an opportunity to discuss intimately the safety problems of the group.

The appointment of a competent employee as his safety assistant enables the foreman in many cases to carry out the details of his accident prevention plans more efficiently.

Periodic interdepartmental safety contests serve to intensify the interest of supervisors and men.

The success of departmental safety work depends largely upon the ability of operating officials and executives to encourage constant effort on the part of foremen. Experience has shown that this may best be accomplished by keeping in close touch with them on the job.

Periodic safety visits to operations by officials, superintendents or Safety Directors are usually made to inspect a department, to investigate the circumstances surrounding a recent accident or to confer with supervisors concerning specific safety problems or additional mechanical or physical safeguarding requirements.

Recognition of Safety Work

Occasionally, a safety suggestion made by a member of a department is discussed with the foreman in charge to determine its merit. Visits are also frequently made to congratulate supervisors on behalf of the company for an excellent safety record, to determine the cause of excessive accident cost, to solicit co-operation in arranging for special safety activities or to encourage greater effort because of unsatisfactory accident experience.

Official recognition of efficient safety work generally provides the most effective means of imbuing the supervisory force with the "safety spirit."

As a rule, the Insurance or Safety Department maintains a record of the company's accident experience. From it a monthly departmental report, showing the number of lost-time accidents, the estimated number of days lost and approximate cost, is often prepared and sent by the chief operating official to each supervisor. In some organizations, accident costs when obtainable, are charged to departmental operating accounts; and the foreman in whose departments accidents have occurred are notified accordingly. These measures serve to emphasize, the effect of accidents upon operating costs and to commend or penalize supervisors for the results they have obtained.

Often bonuses are granted or prizes donated to foremen and employees of a department making an outstanding safety record or winning a safety contest. In some cases, safety as well as production records are made the basis for promotion.

New Plant Construction

Construction of a new chemical plant at Priest River, Idaho, one of seven to be established in the northwestern part of that state, is reported about to begin. A concern in New York, said to be a $50,000,000 outfit, is said to be financing this projected chain of chemical plants. This first plant will be built in time to operate when a projected paper mill is opened at Priest River and will treat timber before it is used in the pulp mill, extracting chemicals needed by the New York company.

Canadian Carbonate Co. is erecting a plant at Edmonton for manufacture of carbon dioxide from coke. Company is also erecting third factory in Montreal in which the Backhaus process will be used. It will soon possess nine factories in Canada located as follows: Dartmouth, N. S., Toronto and Hamilton, Ont., St. Boniface, Man., Edmonton, Alberta, Vancouver, B. C., and three in Montreal, P. Q.

Duval Texas Sulphur Co., subsidiary of United Gas Co., lets contract to install a second plant, more than doubling present capacity. Shipments of sulfur will begin about May 1. Company has elected following officers: chairman, O. R. Seagraves; president, J. W. Cain; vice-presidents, W. L. Moody, 3rd and A. H. Smith; treasurer, W. L. Moody, 3rd; secretary, N. N. Oille.

Liquid Carbonic Corp. plans construction of two branch plants, the first in Cleveland and the second in St. Louis, both to be used in connection with dry ice manufacture. Both will be two-story structures, the first to cost about $100,000 and the second $75,000 including equipment.

Viscose Corp. of America plans construction of addition to rayon mill at Parkersburg, W. Va., to be a complete operating unit, consisting of several buildings to cost more than $2,000,000 and doubling present capacity of about 3,000,000 pounds per month.

Creola Carbon & Gasoline Corp. plans construction of carbon black plant on gas properties located near Mangham, La. Officers are H. E. Oliver, president; W. C. Woolf, vice-president; and B. A. Irwin, secretary. Plant will have capacity of eight million cubic feet of gas daily.

Johns-Manville Co. plans to enlarge its northern California plant by adding a textile manufacturing unit. Company has purchased Weaver-Henry Manufacturing Co., Los Angeles, makers of asphalt composition shingles and roofings.

Toledo Seed & Oil Co., Toledo, plans enlargement of plant to make soy bean oil. Company will spend $100,000 on special machinery.

Hooker Electrochemical Co. plans early construction of addition to new Tacoma plant, consisting of one-story units reported to cost over $200,000 with machinery.

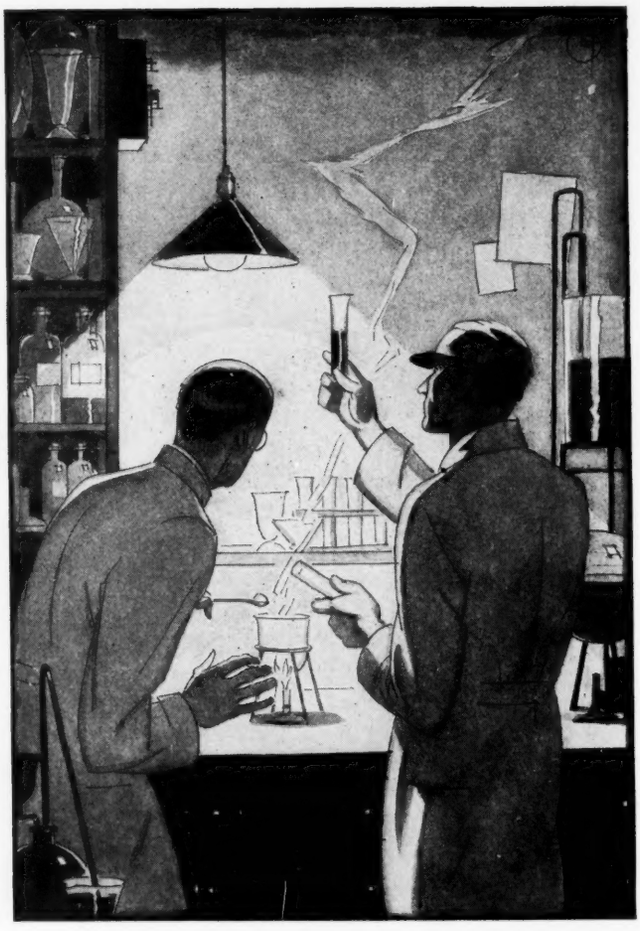
Jones-Dabney Co., varnish manufacturers, Louisville, Ky., plans erection of three-story addition for manufacture of nitrocellulose lacquer, to cost about $75,000.

Bartow Turpentine Co. is erecting a plant at Bartow, Fla., for manufacture of naval stores products.

Vidalia Chemical Co., Vidalia, Ga., constructs a fertilizer mixing plant in that city, which is now running to capacity.

Air Reduction Co., Inc., will construct plant in Toledo to serve plants in district using oxygen and acetylene.

Does your product or process need a plus feature?



TOO many discards? Lost motion? Complaints about the quality of finished products? Has competition got the edge on you with a brand new feature? Some of America's leading organic chemists spend their entire time solving such problems for various manufacturers in the splendidly equipped du Pont research laboratories at Deepwater Point, N. J.

Here are model rubber plants, leather factories, paper plants, printing ink mills, textile works where new formulas, new ideas, new plus features for innumerable products are given a practical work-out.

For instance, du Pont Neozone, the new antioxidant, adds years to the life of rubber. Resisto-Filters have overcome the difficulty of premature failure of cloths for acid filtrations, and the consequent interruption of production and boosting of manufacturing costs. When color became the vogue in the rubber industry, the du Pont laboratories brought forth a full line of organic colors for rubber manufacturers.

ORGANIC CHEMICALS

* * *

Dyestuff Intermediates

* * *

Rubber Chemicals

Accelerators
Antioxidants
Organic Colors

* * *

Resisto-Filters

Outwear ordinary filter cloths many times

Aside from the working out of a definite problem, the du Pont Company offers a remarkably varied line of organic chemicals. The large consumption of such chemicals by the du Pont Company itself guarantees you the finest quality and constantly available stocks.

The technical services of the du Pont organic chemical laboratories are freely available for solving problems connected with the use of our products. Let them provide a plus feature for your product or solve that production problem.

E. I. DU PONT DE NEMOURS & COMPANY, Inc., WILMINGTON, DELAWARE
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CHICAGO, ILL. 1114 Union Trust Bldg.
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DU PONT REG. U. S. PAT. OFF. ***Organic Chemicals***

New Incorporations

Somerset Chemical Co., Inc., Bernardsville—Perce de Stanley Townely—90 shs. com.

Synthetic Plastics Company, Inc., Wilmington, Del., aircraft—Corporation Trust Company of America.

W. A. Rigney Company, Wilmington, Del., drugs, chemicals—Corporation Service Company—9,000 shs. com.

Sykes-Rigney Company, Wilmington, Del, chemicals—Corporation Service Company 4,000 shs. com.

Gillespie Rogers Pyatt Co., Inc., Brooklyn, N. Y., paints, chemicals—Corp. Trust Co. of America—37,500 shs. com.

Oil Improvement Corp., fuels, chemicals—Kornfeld & Bisgair, 11 Park Place —$100.00 pf 1,000 shs. com.

American Dekart Co., Inc., Wilmington, gypsum products, plaste of paris—Corp. Service Co.—65,000 shs. com.

Texhoma Gin Co., Wilmington, cotton, cotton seed, cotton oils,—Corp. Trust Co. of America—150,000.

Chemical Metal Solvents Corp., Wilmington, patents—Corp. Trust Co. of America 500,000 shs. com.

Sunshine Pharmaceutical Co., chemicals—I. Horowitz, 32 Union Sq—10,000.

Commercial Laboratories, Plainfield, chemicals, etc.—A. J. Brunson, Plainfield 450 shs. com.

Operators Factorage & Co., Inc., Wilmington, naval stores, pine products—Horace Greeley & Waitburn, Wilmington—50,000.

Nip Chemical Corporation—Lottman & Stillman, 305 Broadway—20,000 shs. com.

United Westvaco Co., Dover, stocks, bonds—U. S. Corp. Co.—21,600 shs. com.

Processed Materials, chemicals, etc.—Filer not given—1,000 shs. com.

Bel Art Products, chemicals—A. S. Fraser, 2 Layfayette St.—25,000.

Capitol Asbestos Products Corp.—M. Rubien, 63 Park Place—20,000.

National Cellulose Corp., Baldwinsville, 14,500 to 50,000 shares no par.

Pharmacal Research, chemical trades—R. Brown, 11 Park Place—20,000.

Pape Operating Corp., chemicals —C. Ehlermann, 68 William St.—200 shs. com.

Marcus & Shapiro, chemicals—L. S. Wettels, 116 Nassau St. Manhattan—6,000.

Oxyborate Co., Buffalo, chemicals—Morey & Schlenker, Buffalo—500 shs. com.

Riverside Laboratories, chemicals—J. Parker, 150 Broadway—200 shs. com. New York City, N. Y.

Thoro Chemical Company, drugs, medicines—Grace & Grace, 26 Court St—100 shs.—Brooklyn, N. Y.

Ansbacher Corporation, formed by Consolidated of Ansbacher Color Corporation and Ansbacher Insecticide Company—Jerome & Rand, 15 Broad St.—$160,000 pf, 30,000 shs. com. New York.

Atiska Products, chemicals—S. Broad, 261 Broadway—10,000—New York City.

Vitisol Corp., chemicals—Burnstine & Geist, 276 5th Ave.—100 shs. com.—New York City.

Yardsville Chemical & Solvent Co., Inc., Trenton, chemicals—U. S. Corp. Co., 25,000—Philadelphia.

Hospital Products Corp. of Am., Wilmington, chemicals—American Guaranty and Trust Co—$250,000.

Idinal Corp., New York, chemicals, drugs, ores, metals—U. S. Corp. Co. $25,000 1,000 shs. com.

Suckow Borax Mines Consolidated, Inc., Dover, Del., crude borax or tincal—United States Corporation Company—$400,000, 160,000 shs. com.

Bell Allied Products Corporation, Eilmington, Del., chemists, druggists, dry-salters—Corporation Trust Company of America—$250,000, 55,000 shs. com.

The Calco Chemical Company, Inc., Wilmington, Del—Corporation Trust Company of America—10,000 shs. com.

Ranfac Process Corporation, Brooklyn, oils, turpentine, paints—Prentice-Hall, Inc., of Delaware, Dover, Del.—$10,000, 500 shs. com.

Drucham Laboratories, Inc., Dover, Del., stearin, paraffin, spermaceti, bees wax, tall—United States Corporation Company—250 shs. com.

Goodyear Chemical Co., Inc., Jersey City, N. J.—R. A. Van Voorhis, Jersey City, N. J.—500,000.

Synthetic Rubber Company—Corporation Trust Company of America—200,000 shs. com.

Bizzoni, Ltd., chemicals—Leonard, Cushman & Suydam, 25 Broad St.—$200,000 pf. 5,000 shs. com.

Atlantic Gypsum Co., Truro, Nova Scotia, plans to spend $600,000 during 1929 for plant extensions at its quarries at Cheticalamp, Cape Breton. A large modern mill will be constructed as an enlargement to present plant.

Atmospheric Nitrogen Corp. plans to begin construction on one section of a new unit for its $125,000,000 plant at Hopewell, Va. First unit was completed early this year at cost of about $45,000,000.

Dust Recovering & Conveying Co., Cleveland, issues bulletin No. 16, entitled "Solving a Fume Problem," which describes the use of a dust recovery system in a lead oxide plant.

Staley Laboratory Co., Inc., Norfolk, Va., plans plant extensions and installation of additional machine to cost about $25,000.

Furst-McNess Co., Freeport, Ill., chemical specialties, plans factory addition to cost about $150,000.

Bates Valve Bag Corp. changes name to Bag & Machine Corp., New York City.

Percy Kent Bag Co. is erecting a new one-story building in Norfolk, Va.

Germany Experimenting With Caustic Soda By Fluoride Process

Caustic soda manufactured by the fluoride process is being experimented with in Germany. A considerable number of applications have been made in Germany on methods for the formation and decomposition of complex fluorine compounds. These patents have been taken out in a variety of names, but those of the Ring Gesellschaft Chemischer Unternehmungen, of the E. de Haen A. G., of M. Buchner and of A. F. Meyerhofer are most frequently encountered. It was difficult to tell from the complexity of the specifications exactly what was the object of these German investigators, but light is now thrown on the subject by Dr. Wilhelm Siegel, of Berlin, who writes in the "Chemiker-Zeitung" of February 20. Dr. Siegel points out that these various patents are all part of the process that have been worked out by the Ring concern for the improvement of the fluoride soda process.

The process is dependent upon the use of fluorine compounds and is a cyclic one, the fluorine products being recovered continuously. The process depends upon the decomposition of sodium fluoride with milk of lime, leading to the production of

$$2NaF + Ca(OH)_2 = 2NaOH + CaF_2$$

a solution of caustic soda and a precipitate of calcium fluoride. Its advantages are the simplicity of the reaction whereby the sodium fluoride is decomposed with milk of lime. The reaction takes place readily and goes practically to completion. Concentration plays a very minor rôle, so that there is no need to get the reacting substances into complete solution and the lime hydrate can be used without any excess of water. This means that the caustic soda can be obtained in a much higher degree of concentration than is possible by causticising sodium carbonate and, further, there is no loss due to the formation of double compounds. The difficulty about the process, is that of re-converting the calcium fluoride into sodium fluoride and it is upon the satisfactory obviation of this difficulty that the commercial success of the process must obviously depend.

Smith-Scott-Hamburg Welding Co. is denied order restraining Fire Commissioner Dorman, New York, from continuing to approve only the "protruding head" type of tank truck for transporting inflammable oils in New York, and compelling him to approve a tank for which the plaintiff submitted plans.

Alsop Engineering Co., New York, is distributing, upon request, its new booklet showing installations of glass-lined equipment in various plants, together with its line of portable electric mixers and a new glass-lined electric mixing tank.

Brown Instrument Co., Philadelphia, is distributing, on request, a new 48-page booklet called a "Power Plant Instrument Data Book" which describes applications of instruments to the steam power plant.

Combustion Engineering Corp. issues a new catalogue describing the C-E Multiple Retort Underfeed Stoker (Super Station Type).

Robeson Process Co. announces removal of general offices to New York Central Building, New York.

Du Pont Cellophane Co. announces opening of a branch sales office in the Liberty Title and Trust Building, Philadelphia.

A. O. Smith Corp., Milwaukee, distributed bulletin 507, carrying a description of "SMITHWelded" construction.

U. S. Stoneware Co. issues X-Ray Bulletin 303, describing developing tanks, laboratory sinks, jars, etc.

Armstrong Cork & Insulation Co. announces removal of general offices to Lancaster, Pa.

Globo

Spray Congealed

TRI-SODIUM PHOSPHATE

Meets the demand for an improved water softener- and cleaning-compound---

GLOBO,* Spray Congealed Tri-Sodium Phosphate has set a new high standard of quality in water softeners and cleaning compounds. It has introduced improved methods in the manufacture of Tri-Sodium Phosphate. But only GLOBO* measures up to the exacting Federal specifications.

GLOBO* is a superior Tri-Sodium Phosphate of uniform globular shaped crystal size—free flowing and quickly soluble. It will meet your requirements for improved quality without increase in price. Order a sample keg, bag or barrel. Immediate delivery will be made.

FEDERAL PHOSPHORUS COMPANY
Division of
THE SWANN CORPORATION
Birmingham, Alabama

GLOBO *is packed in the following size containers:*
125 lb. Kegs
200 lb.—Bags
325 lb.—Bbls.

**The name GLOBO is derived from Globular meaning round or spherical in shape.*

FIBRE DRUMS

As Chemical Containers

By Henry Craemer

Sales Manager, Carpenter Container Corp.

SELECTION of fibre drums as suitable containers for bulk supplies of boric acid, petrolatum, and lanolin, taken by Commander Byrd on his Antarctic Expedition is conclusive evidence of the fact that fibre drums have been perfected to such a degree that they are safe packages for the shipment of sensitive and perishable chemical products under the most trying conditions. On a journey of such character, involving extreme changes of temperature and of atmospheric conditions, in addition to the hazards of transportation and storage that distance and time entail, it was essential that the packages used should preserve their contents instantly accessible and always usable. E. R. Squibb & Sons who furnished the medical supplies for this Expedition use fibre drums as their standard bulk package and knew by experience that fibre drums were peculiarly well adapted for the purpose.

When the fibre drum was first introduced as a bulk package it was offered as a cheap substitute for the wooden barrel and the steel drum. Service was sacrificed to price with the result that it failed of its purpose. It remained, however, for Herbert L. Carpenter, inventor of the Carpenter Sealed Fibre Drum, to realize that the fibre drum could be scientifically developed to meet the need for a bulk package to give maximum protection to sensitive chemicals and continue this protection until its contents were exhausted. He perfected the Carpenter Triple Sealed Closure and made the fibre drum a serviceable, practical and attractive package.

This triple sealed closure was a simple yet practical device. It made possible the use of the natural strength of a cylindrical shell in a container that would be made tight and yet could be easily opened and closed again innumerable times. How this was accomplished is shown in the accompanying figure. This unique closure is simple and effective. It requires no skilled labor or special tools and is practically fool proof. The waxed fibre sealing disc comes already formed. It is placed across the full open top, the flanged one piece top is pressed in and the steel rim is quickly pushed down flush with the top and nails are driven through the rims and fibre shell and into the wooden head. This solid one piece wood head adds strength to the fibre drum.

Opening the drum is even more simple than closing it. The nails are easily removed with a claw hammer or screw driver, the hinged rim is pried off and the head pulled out by means of the ring provided for this purpose. The contents of the drum are not exposed until the formed waxed fibre seal is lifted off. Then the full open top gives free access to the contents. The closure is not destroyed in opening and the drum can easily be closed and sealed again. It is this easy re-sealing feature that makes this type fibre drum especially serviceable for reagent chemicals that are not entirely used when the drum is first opened. The protection afforded by the sealed closure continues until the product to be protected is entirely consumed. Many manufacturers of reagent chemicals sold only in subdivided form use these fibre drums in their manufacturing departments to store their products pending subdivision. Manufacturers of proprietaries and pharmaceuticals specify that raw materials be shipped in fibre drums so that they may utilize them for safely storing such materials until used. Others use them as factory roving cans. While designed as a single trip container they are so durable that they are frequently reused.

A. Specially treated fibre disk, stretched under head and over edge of shell.
B. Strong flanged wood head, having straight sides tapered at bottom for wedge fit.
C. Angle-shaped, hinged, self-locking steel rim.
D. Nails (or pail clips) are driven thru rim, shell and seal into heads.
E. Laminated fibre shell.
F. Japanned ring, convenient for pulling out top head after nails are drawn and rim removed.

The fibre drum reduces to a minimum the "breathing" which is characteristic of some metal drums with friction closures. Unlike metal, fibre is a very poor conductor of heat and the alternate exposure to heat and to cold that a drum may be subjected to in transit or storage will not cause the air inside the drum to expand and contract. It is this expansion and contraction of the air inside a metal drum that forces the air in and out of a friction closure and, as air is the cause of moisture, this "breathing" permits moisture to enter and affect the chemicals contained therein. It is this absence of "breathing" in the fibre drum that has made it suitable for even such sensitive or hygroscopic chemicals as calcium chloride anhydrous, hexamethylenetetramine, para-nitroaniline and para-dichlorbenzene. But when an unusually hygroscopic chemical such as zinc chloride is shipped or stored the fibre drum is made absolutely tight by a special treatment of the inside of the drum.

The ability of the fibre drum to resist moisture and water has been demonstrated from time to time in unusual and unexpected ways. They have been left on loading platforms during violent rainstorms, they have been exposed to the direct stream of fire hoses in the course of a warehouse fire and have remained submerged in flooded cellars for days. In every case, their contents remained dry. Ordinary library paste has been kept in perfect condition for over a year, despite the fact that the fibre drum was opened at frequent intervals for inspection. Such protection, made possible by the fibre drum, makes for elimination of losses of materials that must be stored for a long time in the normal process of distribution and use. For some types of adhesives, fibre drums are provided completely assembled with a bung hole in the top. Such drums permit rapid filling through the bung hole and still give the consumer easy access to the adhesive through the full open top.

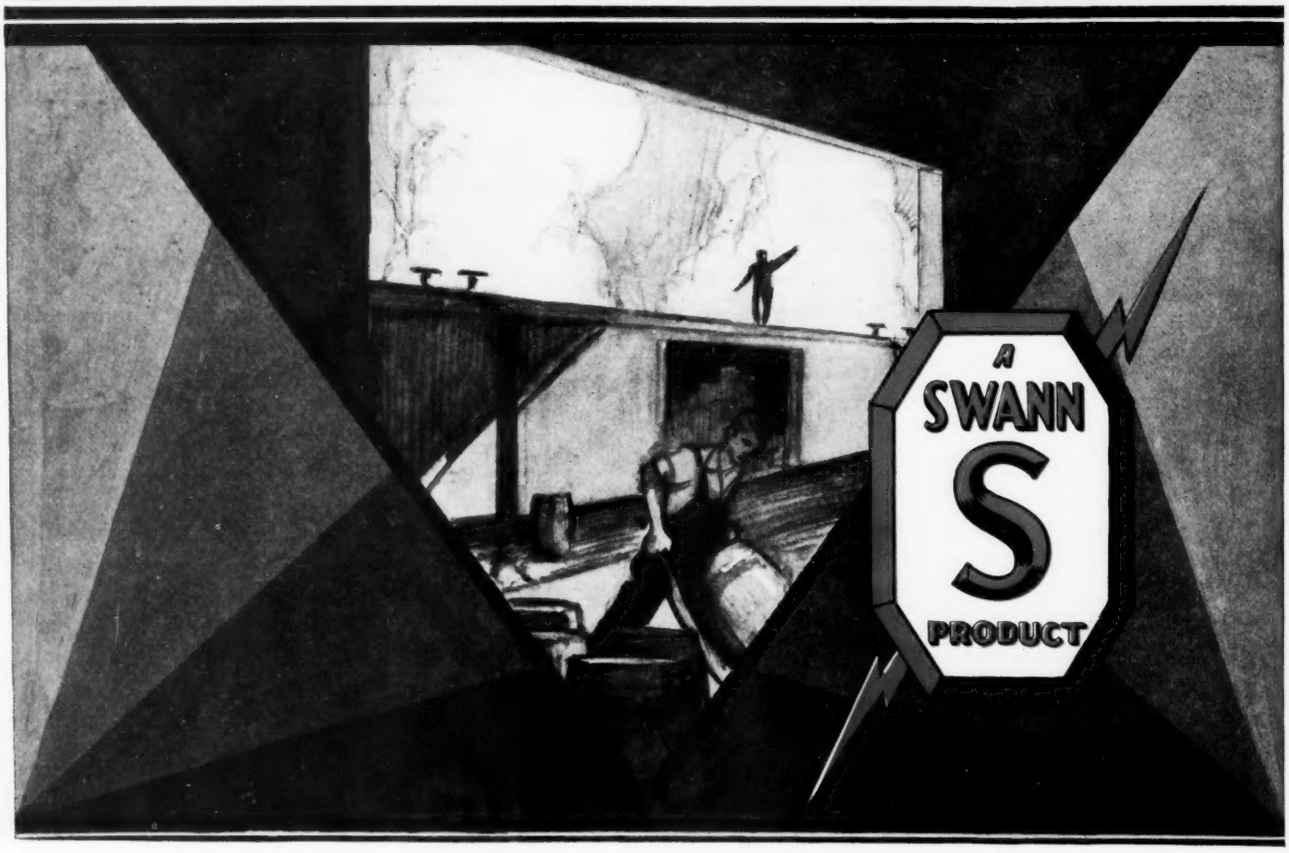
The unusual strength of the laminated fibre drum, due to its cylindrical shape and the materials entering into its construction, has been demonstrated in its ability to meet severe shipping and storing requirements. Fibre drums in mixed export shipments with barrels have arrived in sound condition. They have the advantage over the bilge barrels in that side strain is distributed over the entire straight side of the drum while on the barrel the strain bears directly on the bilge, tending to flatten the staves and working the stave against the top and bottom and often causing sifting. Fibre drums store best standing on end. In some cases they have been required to support heavy weights because of limited storing space. In one instance drums packed with 450 pounds of alloy were stacked five high on the head. In another case drums filled with 300 pounds of tartaric acid were stacked nine high on the side without injury.

For years the fibre drum was thought of only in connection with dry chemicals but the full open top, which is characteristic of the fibre drum, appealed to manufacturers of products not dry and the demand grew for fibre drums that would carry pastes, plastic products and even semi-liquids. Developmental research was carried on and as a result fibre drums are now being extensively used for such products as sulfur paste (30 to 40 per cent. water content), refractory cements, adhesive pastes, soap pastes, greases, heavy lubricating oils, dental creams, confectionery creams, salves, petrolatums and paste colors. So well has the fibre drum demonstrated its adaptability to products not dry and to semi-liquids that the carriers themselves proposed a revision of Rule 41 of Consolidated Classifications and effective February 1, 1929, fibre drums became available for such products.

One of the outstanding values of the fibre drum for chemicals is the complete absence of metal in any form from the inside of the drum. This eliminates all danger of rusting, flaking corrosion or chemical reaction that might result from the presence of moisture and metal. The absence of metal on the inside of the fibre drum also eliminates sweating or the condensation of moisture as encountered in metal drums. Lightness of weight is combined with strength in the fibre drum. This makes possible considerable saving in the freight on the tare of the package. Not only do fibre drums weigh less than wooden barrels or steel drums but because of their straight sides, more of them can be packed to a layer in straight carload shipments. Where only 85 barrels

Chemical supplies which accompanied the Byrd Antarctic Expedition included boric acid, petrolatum and lanolin packed in fibre containers.

Building Confidence



"CONFIDENCE" has been defined by authorities as "trust in or reliance upon another; belief in a person or thing"; so that building confidence is the most important activity of any manufacturer. Years of strict adherence to a fixed policy of high quality and efficient service has gained for The Swann Corporation the confidence of thousands. Look for the value mark of Swann Products — it represents the confidence of buyers and plant executives all over the world.

Divisions of THE SWANN CORPORATION *And Their Products*

Federal Phosphorus Co.
Birmingham, Ala.

Phosphoric Acid 75% HPO_3
Phosphoric Acid 50% HPO_3
Mono Sodium Phosphate
Tri Sodium Phosphate
Acid Sodium Phosphate, Pyro
Mono Ammonium Phosphate
Di Ammonium Phosphate
Di Calcium Phosphate
Tri Calcium Phosphate
Phosphoric Acid Paste

Diphenyl

Textile Oils and Chemicals

Federal Abrasives Co.
Birmingham, Ala.

Aluminous Oxide Abrasive Grain
Silicon Carbide Abrasive Grain

Southern Manganese Corp.
Birmingham, Ala.

Ferro Phosphorus 24% P.
Ferro Phosphorus 18% P.

Provident Chemical Works
St. Louis, Mo.

Mono Calcium Phosphate (H. T. Phosphate)
Phosphoric Acid
Acid Calcium Phosphate
Pyro Calcium Phosphate
Di Calcium Phosphate
Tri Calcium Phosphate
Pyro Sodium Phosphate
Tri Sodium Phosphate
Crystalline Phosphate, etc.
Calcium Sulphate
Bicarbonate of Soda
Sodium Aluminum Sulphate
Laundry Soap Builders

The SWANN CORPORATION
Birmingham, Alabama – Anniston, Alabama – St. Louis, Missouri.

or 75 side ring drums may be packed in a 36′ car, 105 fibre drums may be packed, increasing the total weight of the commodity over 10% and reducing the tare from 50 to 75 per cent.

One of the most recent developments of the fibre drum is the greaseproof fibre drum for the shipment of lubricating compounds such as cup greases, axle greases, transmission greases, petrolatum, lard, lanolin and vegetable oil compounds. Fibre drums for such products have the advantage over metal in that they can be easily destroyed by burning when empty, thus solving the problem of how to dispose of the non-returnable empty. They also have the advantage for such products of eliminating discoloration sometimes developed in metal containers.

Another advantage of the fibre drum is its clean, sanitary interior which makes it a suitable container for medicinals or reagents in bulk. Made under sanitary conditions and from sterilized materials, it requires no cleaning out before use and eliminates the need for a liner. Where the waxed fibre seal should be kept from direct contact with any chemical, an extra seal of parchment is supplied. The inside wall of the fibre shell is smooth and hard and will resist the abrasive action of most crystals but can be reinforced by treatment so as to be suitable for such coarse crystals as sodium and potassium fluoride.

Recent Lining Developments

The uses of fibre drums for chemicals, already widespread, are being constantly expanded due to the apparent unlimited adaptability of this type of package. Research work is being continued and a new field of use may develop through the application of non-ferrous metallic foils as linings for the inside of these drums. It is now possible to obtain fibre drums, lined inside with aluminum foil in such a way that nothing but pure aluminum can touch the contents. Tin foil, copper foil, and lead foil are now available. Where non-ferrous metal is required to carry a chemical, it may be obtained in a container at a minimum cost combined with the strength and practicability of the fibre drum.

While the primary function of a container is to carry safely and protect its contents, every container has a secondary function that is not always utilized, although in many cases it is of great importance. This secondary function is to represent the shipper while it is in the hands of his customer. Every container has the power to make a favorable or an unfavorable impression on its receivers and thus to build or destroy goodwill for the shipper. Many containers are purchased with a regard only for their primary function and when so purchased are rightly considered as packing expenses—a non-productive item of production cost. But when a container is selected that makes a favorable impression on its receiver and constantly reminds him of the shipper and the name and value of his product, it helps encourage repeat orders and is directly helping to increase his sales and build goodwill. When a container exercises this secondary function in a positive way for the benefit of the shipper its cost is not all packing expense but partly profit-producing sales promotion and good advertising and its cost is directly reduced by the value of this secondary function. This type fibre drum performs both of these functions in a highly satisfactory manner. It is attractive in appearance and its straight sides makes it a fine vehicle for a display label or a printed brand or the trade mark and name of the shipper.

Fibre drums for chemicals are available in many sizes ranging in capacity from one to forty-one gallons and are permitted for less than carload shipments of from 25 to 375 pounds gross and on straight carload shipments are used for heavier loads. They have been approved for poisonous solids. They are accepted for parcel post and express shipments as well as for export and have demonstrated their ability to render valuable service to the chemical industry.

Ruling Decides Sulfuric Acid Rates Same for Drum or Tank Shipment

Sulfuric acid in iron or steel barrels or drums should not take higher freight rates than when shipped in tankcars, according to ruling of Interstate Commerce Commission.

In complaint brought by the Rio Grande Oil Company of Phoenix, Arizona, the commission set 41 cents per 100 pounds as the proper rate on sulfuric acid in barrels from Los Angeles, Cal., to Phoenix, the same as the commodity rate applying on tank car shipments. Regarding the difference between package and tankcar shipments the commission said:—

On various liquids, such as asphalt, carbon bisulfide, denatured alcohol, cottonseed oil, linseed oil, tallow and grease, rates which apply between Los Angeles, and Phoenix are the same whether shipped in tankcar loads or in packages.

Defendants contend that there is a greater hazard in transporting sulfuric acid in iron or steel barrels than in handling the bulk acid in tankcar loads, and that for that reason the rates on the former should be greater. On the record we are not conceived that sulfuric acid in iron or steel barrels should take higher rates than when shipped in tankcars.

New York State Public Service Commission approves new freight rates of the New York Central (East) on carbon bisulphide in tankcars, carload (rates per cwt.) from Chauncey to stations Lancaster to Lewiston, inclusive, and Lockport to Mapleton inclusive, 34.5c. (reduction of 3.5c.) and from Cascade Mills to stations Depew to Lewiston inclusive, 25c. (reduction 3.5c.) effective April 1.

On complaint of the Barrett Co. the Interstate Commerce Commission orders the freight rate on coaltar oil, tankcar loads, from Edgewater, N. J., to Philadelphia, Pa., reduced from 16 cents per 100 pounds to 14.5 cents, the same rate as now exists on tar oil from Jersey City to Philadelphia, the latter rate being declared reasonable.

Present freight rate of 25 cents per 100 pounds on crude coaltar from Pittsburgh, Erie, and Woodlawn, Pa., and Weirton, W. Va., to Bayway, N. J., is reduced to 23 cents by the Interstate Commerce Commission on complaint of the Allied Tar & Chemical Corporation.

Chemical Facts and Figures

I. G. Representatives Arrive to Push Plans for Activities Here

Drs. Bosch and Bueb Included In Group Now Negotiating For American Expansion—Nitrogen Plant and American Holding Company Thought To Be Main Objectives of Visit—Plan Increased Sales of Mixed Fertilizers

With characteristic German reticence and closely chaperoned by the redoubtable Colonel Herman A. Metz, president, General Dyestuff Corp., who had accompanied the revenue cutter down the bay and boarded the ship at quarantine, a delegation of the executives of the I. G. Farbenindustrie, headed by the president of the organization, Dr. Carl Bosch, arrived in the United States, via the S. S. "Deutschland", March 19. Included in the group were Dr. Julius Bueb, Dr. Curt Duisberg, chairman of the board of directors, Dr. Wilhelm Gaus and Dr. August von Knieriem.

Immediately the air was filled with rumors, chief among which were those concerning the establishment of a nitrogen plant in America, the formation of an American holding company or the introduction of shares of a Swiss subsidiary on the New York Stock Exchange. But these the visitors, with unexampled suavity and adroitness, succeeded in keeping in exactly that status. They were still bona fide rumors, having been neither affirmed or denied.

Before the departure of this delegation from Germany a fundamental reorganization of the corporate structure of the I. G. Farbenindustrie was accomplished, resulting in the concentration of many of the wide-flung international holdings of the dye trust in the hitherto small Swiss subsidiary of the company, the Internazionale Gesellschaft fur Chemische Unternehmnugen, formed last summer. This Swiss company, generally referred to as I. G. Chemie, will thus be expanded as the leading international holding company of the German chemical manufacturing interests.

The I. G. is known to have desired the listing of its shares on the New York market in the past, but previous attempts are said to have been opposed here by American chemical interests on the grounds that it would tend to hurt the competitive position of the American chemical industry.

The I. G. Chemie of Basel has increased its capitalization from 20,000,000 to 250,000,000 Swiss francs. It will offer its shares at 150 per cent. of par to shareholders in the I. G. permitting the purchase of 500 Swiss francs nominal value of its shares for each 6,000 marks of I. G. held. Debenture holders of I. G. will be permitted to buy 500 Swiss francs nominal value for each 12,000 marks of debentures held. Rights are estimated to be worth six points for each share. This offering will absorb approximately 80,000,000 Swiss francs par value of stock of the company. The balance of the present authorized capital will, it is expected, be turned over to the I. G. in return for securities turned over, thus giving the latter stock control of the Swiss company.

The I. G. Chemie has also arranged with the I. G. to work very closely in co-operation with it. Until December 31, 1928, I. G. will guaranty that the stock of the Swiss company shall receive the same rate of dividends as it pays on its own shares. After that date 500 Swiss francs of I. G. Chemie stock will be madeconvertible into 400 marks of I. G. Stock. Furthermore the I. G. Farben will get options to acquire under fixed conditions most of the holdings of the Swiss subsidiary.

Numerous rumors are in circulation regarding the probable I. G. acquisitions in this country through the medium of the new Swiss holding company. Chief among the desires of the company is said to be the financing of the erection or the purchase of a nitrogen-fixation plant in the South. The company is also interested in extending the sale of its mixed fertilizers in this country, which sale is at present handled through the Synthetic Nitrogen Products Corp. It is also pointed out that the I. G. has no sales or manufacturing representative in the American rayon industry, and that the establishment of a rayon plant in the South would be particularly desirable.

Wood Chemical Institute Formed in Wood Distillation Industry

Wood Chemical Institute, Inc., is formed at a meeting of representatives of the hardwood distillation industry, held March 21, at the Hotel Statler, Buffalo. This is the first step in the formation of a trade association within the industry. It already includes a substantial portion of the capacity of the industry, and other units will be added as the organization proceeds.

Temporary officers and directors have been elected as follows and offices established at 231 S. La Salle st., Chicago: president, W. L. Hein; vice-president, W. J. Merwin; secretary and treasurer, L. T. Kniskern; directors—M. C. Burt, Gray Chemical Co.; F. F. Clawson, Clawson Chemical Co.; W. Z. Georgia, Buckhannon Chemical Co.; W. L. Hein, Otto Chemica[1] Co.; A. Keery, Custer City Chemical Co.; L. T. Kniskern, Receivers of Charcoal Iron Co.; J. A. McCormack, Union Charcoal and Chemical Co.; W. J. Merwin, Thomas Keery Co., Inc.; M. F. Quinn, Vandalia Chemical Co.; C. A. Saunders, Cadillac-Soo Lumber Co.; John Troy, Heinemann Chemical Co.

Salesmen's Association Planning Banquet During Exposition Week

Salesmen's Association announces that the biennial Chemical Industries banquet, already set for May 9, will be held in the grand ballroom, Hotel Roosevelt, New York. Tickets for the banquet will cost $7 each.

During each chemical show week for several years past the Salesmen's Association has sponsored this dinner, the attendance last year having gone over 500—the largest gathering of men engaged in various branches of the chemical industry. The committee expects to announce the principal speaker in the near future. He will be a man of national prominence.

Plans are proceeding rapidly and exhibit spaces are being reserved for the Twelfth Exposition of Chemical Industries at the Grand Central Palace, New York, week of May 6. In addition to the banquet, the week will be featured by Export Day on May 9.

American Agricultural Chemical Co. announces that operations at the Jacksonville, Fla., plant of the company will be continued, despite removal of sales offices from that point to Lakeland, Fla.

General Industrial Alcohol Co., New Orleans, announces the appointment of Woodall, Corbett Co., Boston, as its New England representative.

Minnesota Linseed Oil Paint Co. changes capital from 180,000 shares to 150,000 shares no par.

Events of 1909

Roosevelt leaves for Africa

Over 20 Years Ago E B G Pioneered in the Manufacture of Liquid Chlorine

THE name of Theodore Roosevelt, twenty-sixth president of the United States, always will stand for the dynamic spirit that conquers every obstacle to progress.

The year that he relinquished office, and set sail for Africa, was signalized by another conquest, this time in the industrial field. It was the introduction of Liquid Chlorine for bleaching. To E B G went this honor of first liquefying Chlorine Gas in the United States.

The first pound of Liquid Chlorine produced in the U. S. A. 1907

The striking advantages of Liquid Chlorine have been broadened by the scientific manner in which E B G has conducted its manufacture, distribution, and assisted in its efficient use.

Strict excellence is maintained by expert technical control, by large and modern production facilities. These constitute real advantages for E B G customers.

Liquid Chlorine

Electro Bleaching Gas Co.

PIONEER MANUFACTURERS of LIQUID CHLORINE

PLANT:
Niagara Falls, N. Y.

MAIN OFFICE:
9 East 41st Street
New York

Personal and Personnel

Dr. Louis M. Roeg, research director from 1920-25, Pompeian Corp., Baltimore, and since 1925 chief chemist, Brewer & Co., Inc., Worcester, Mass., and chairman, olive oil committee, American Oil Chemists' Society, becomes sales manager, Lucidol Corp., Buffalo, manufacturer of "Lucidol", benzoyl peroxide used for decolorizing oils, fats and waxes.

William D. Barry, Mallinckrodt Chemical Works, New York; Robert W. Brewer, Liberty By-Products Works, Belleville, N. J.; Charles E. Kelly, Haggerty Bros. Co., New York; and Albert R. Rittger, Eureka Aniline Products Corp., New York, are elected to membership in the Salesmen's Association.

Edward R. Weidlein, Mellon Institute; Burton L. Pfeiffer, Calco Chemical Co.; and Lowther B. Cheney, American Cyanamid Co., are among those recently elected to fellowship in the American Institute of Chemists. Walter R. Clark, Grasselli Chemical Co., is a new junior member.

Professor William Lloyd Evans, Ohio State University, is presented with the Nichols Medal for 1929, March 1, at the Chemists' Club, New York, in recognition of his achievements during twenty years of research into the construction of the sugar molecule.

Major General Amos A. Fries, who has been chief of the Chemical Warfare Service since 1920, is replaced March 28 upon the termination of his four-year term by Col. Harry L. Gilchrist, chief of the medical division of the service.

Col. Herman A. Metz, president, General Dyestuff Corp., heads the importers' committee for the ceremonies in connection with dedication of new quarters of the U. S. Customs Court, in New York, April 9.

W. R. Siegle is elected chairman, board of directors, Johns-Manville Corp., succeeding H. E. Manville, who resigned to become chairman, executive committee, and Lewis H. Brown is elected president and a director, succeeding the late Theodore F. Merseles.

Captain James P. McGovern, general counsel, Industrial Alcohol Institute, delivers an address on "Practical Co-operation in Law Enforcement," March 23, before the Federal and State Law Enforcement League, Mobile, Ala.

A. G. Schneider, Victor Chemical Works, Chicago, is appointed to Committee No. 1, chemicals, drugs and medicines division, Chicago Association of Commerce ways and means committee.

E. T. Olsen, for the past six years president and general manager, Valley Chemical Co., Charlstadt, N. J., resigns to become manager and director of the new chemical division, F. R. Greene & Co., New York.

A. B. Knoebel, formerly assistant chemist, Monsanto Chemical Works, opens analytical and consulting office at 209 California st., San Francisco.

Raymond Foster, president, Winthrop Chemical Co., New York, sells his home in Elizabeth, N. J., and announces plans to live in San Diego, Cal.

Dr. Mayor F. Fogler, research chemist, Atmospheric Nitrogen Co., is transformed from Syracuse to Hopewell, Va., to head a similar department in the new plant.

Frank E. Lee, treasurer, Nichols Copper Co., is elected to the board of directors, Hibernia Trust Co., New York.

American Chemical Society Plans For Columbus Meeting

American Chemical Society announces the general program for its twenty-seventh meeting, April 29 to May 3, at Columbus, Ohio, as follows: Monday, April 29, will be given to registration, the council meeting and council subscription dinner, followed by a reception and informal dance, all in the Neil House.

General meetings will be held on the following morning in the Chemical Laboratory, Ohio State University. Group A, under the auspices of the Division of Industrial and Engineering Chemistry, will discuss "Economic Relations Between Chemistry and Agriculture," Williams Haynes, CHEMICAL MARKETS, chairman. Some of the subjects tentatively assigned for discussion are as follows: C. H. MacDowell, Armour Fertilizer Works, "The Farm as a Consumer of Chemicals;" Major T. P. Walker, Commercial Solvents Co., "The Farm as a Producer of Chemical Raw Materials;" H. W. Jeffers, Walker-Gordon Dairying Operation, "What the Industrialization of the Farm Means to Chemistry". While plans for the Group B meeting, under the auspices of the Division of Physical and Inorganic Chemistry, have not yet been completed, there will be addresses by Irving Langmuir, president, American Chemical Society, and F. M. Jaeger, University of Groningen.

Divisional meetings will begin the afternoon of April 30 and continue throughout the following day in the university's chemical laboratory. On the evening of May 1, there will be a lecture in the Memorial Hall by C. E. Kenneth Mees, on "The Formation of the Photographic Image," illustrated. At that time, Dr. Mees will also present through the courtesy of the Lick Observatory, a film showing the rotation of Jupiter.

On the following morning, May 2, the divisional meetings will be resumed, with excursions to various industrial plants in Dayton and Columbus, during that afternoon and the following day.

Martin F. Quinn

Martin F. Quinn, pioneer wood distiller, dies in Olean, N. Y., March 30, aged 75. He was born April 11, 1854, and at the time of his death was the only living pioneer of the wood distillation industry. He was the inventor of the modern process of wood distillation and, in addition to being the directing head of the Keystone Wood Chemical and Lumber Corp., Olean, N. Y., said to be the largest wood distillation operation in the world, he was also an executive in twenty-one other corporations. He entered the wood distillation business in 1880 and had been an outstanding figure in it ever since. Since that date, he had conducted nine wood chemical operations, all with recognized success.

He is survived by his wife, one brother and one sister, three daughters and three sons, and nine grandchildren.

Frank Morse Smith, senior partner, H. J. Baker & Bro., New York, dies at his home in Brooklyn, March 22, aged 69. He was born in Kingston, N. Y., came to New York as a boy, and entered the employ of the Baker organization as his first position. He had been with the company 53 years at the time of his death. He was a member of the Union League, Bankers, Montauk of Brooklyn, Riding and Driving and Oakland Golf Clubs, and of the Downtown Association.

Edgar Davis Chittenden, president, E. D. Chittenden Co., Bridgeport, Conn., fertilizers, dies March 16, aged 70. He was born in 1859, educated at the Massachusetts Agricultural College, and in 1883 organized the National Fertilizer Co., Bridgeport. He sold his interest in that firm in 1909 to organize the company he headed at the time of his death.

Theodore R. Dantz, advertising manager, Du Pont Rayon Co., dies in New York, March 12, aged 29.

News of the Companies

Dyestuffs Department, E. I. du Pont de Nemours & Co., Inc., takes charge of all sales of rubber chemicals formerly handled by Grasselli Chemical Co. H. H. Replogle, formerly sales manager, rubber service department, Grasselli Chemical Co., has been appointed sales manager of rubber chemicals for the du Pont organization. E. F. Bridgewater will act as assistant sales manager in charge of technical matters. Intermediates will be distributed through the dyestuffs intermediates section of the division, in charge of F. W. Wolff as sales manager.

U. S. Circuit Court of Appeals, Third Circuit, March 7, in case of Keystone Wood Products Co. against Frank Morse Smith, surviving partner of the firm of H. J. Baker & Bro., and Julius P. Carter, unanimously affirms judgment obtained by Messrs. Smith & Carter against the Keystone Wood Products Co. for $87,003 as damages for breach of contract growing out of the installation of a plant for the extraction of acetic acid from the distillate of wood.

American Commercial Alcohol Co., New York, organizes the American Commercial Alcohol Co. of California to handle its business on the Pacific Coast. Company also purchases International Solvents Co., San Francisco, and merges it with the newly formed subsidiary. Purchase of other California plants is said to be contemplated.

Canadian Industries, Ltd., acquires the Canadian Salt Co., formerly the dominant factor in the manufacture of the alkalis. Recently the company also acquired the Canadian Salt Co. and the Grasselli Chemical Co. of Toronto, so that it is now an increasingly important factor in the heavy chemical business.

Samuel Cabot, Inc., Boston, licenses Brandram-Henderson, Ltd., Montreal, for the exclusive manufacture and sale in Canada of Cabot creosote shingle stains and all of the Cabot colloidal compounds in the paint and varnish lines.

Hooker Electrochemical Co. sells the ten-story building at 25 Pine st., New York, which at present houses its executive and sales offices, to the 36 Wall st. Corp. Company has made no decision as to location of new offices and does not expect to move for several months.

Gillespie, Rogers & Pyatt Co. is incorporated in Delaware with capital of 37,500 shares no par stock, to deal in paints and chemicals. Incorporators are Edwin J. Mellett, Andrew J. Arbuckle and Donald Bourne.

Texas Gulf Sulphur Co. begins production on its new Boling dome, on property of Gulf Oil Co. Development work has been in progress for past several years and over $10,000,000 is said to have been spent bringing dome to production stage.

Anglo-Chilean Consolidated Nitrate Corp. secures option from Loa Nitrate Co. on a large tract of land immediately adjoining present holdings of Anglo-Chilean.

American Agricultural Chemical Co., owner of former Lister plant, Newark, sells eastern portion of property to Robert F. Greenwood.

Wood Distillers' Corp. re-elects officers at annual meeting held in Olean, N. Y., except that P. H. Quinn was named a director succeeding P. H. Quinn.

Carbide & Carbon Chemicals Corp. announces that it is prepared to supply synthetic acetone at prevailing market quotations.

Consolidated Chemical Industries Forms South American Subsidiary

Consolidated Chemical Industries, Ltd., with which is affiliated the Stauffer Chemical Co., forms a South American subsidiary, "La Quimica Industrial de Argentina." This is the fourth of the wholly owned subsidiaries of Consolidated Chemical Industries which was incorporated in Delaware the early part of this year, with a capitalization of $10,000,000, consisting of 320,000 shares of A stock of which 160,000 shares are outstanding, and 80,000 shares of B stock, $25 par value. The other subsidiaries are Texas Chemical Co., Louisiana Chemical Co., and Pacific Bone & Fertilizer Co.

The Argentine company has started construction of the initial unit of plant at Buenos Aires which will cost about $750,000 when completed. While ultimate plans provide for manufacture of chemicals used in the Argentine, the first unit will be confined to the processing of huge quantities of bones gathered from the huge estnacies of the country. Among the products made from the bones by the Argentine company and the American subsidiaries will be bone-black, glue, gelatine, ammonium sulfate and phosphates.

A. K. Hamilton Announces Sales Agents

A. K. Hamilton, New York, representing the Pennsylvania Sugar Co., alcohol division, and the Franco-American Chemical Works, Inc., appoints the Pearling-Scott Brokerage, Duluth; Baker & Collinson, Detroit; and the B. H. Roettker Co., Cincinnati, as sales agents. These companies will handle the sales in their respective territories of Quaker brand alcohol and the industrial and pharmaceutical chemicals made by the Franco-American Chemical Works.

Texas Gulf Sulphur Co. and Union Sulphur are understood to have settled all differences. Law suits for damages and contested leases at Boling Dome filed by Union Sulphur will be dismissed, leaving Texas Gulf in sole control of the Boling development, while Union will have exclusive development of Tibodeaux Dome in Louisiana.

Seaboard Industrial Research Corp. is organized in New York to aid in establishment of companies to work processes prefected or placed on a commercial basis in research laboratories of Dr. John E. Jackson, consulting chemist. The latter is chairman of the board of the new company, and Frank W. Westbrook is president.

Society of Chemical Industry, J. R. Geigy, S. A., and Sandoz Chemical Works, all of Basle, Switzerland, deny that they are related directly or indirectly to Internationale Gesellschaft fur Chemische Unternehmungen, the Swiss company recently formed to work with the I. G.

D. H. Litter Co., New York and Philadelphia, has been appointed exclusive sales agent for Pacific Vegetable Oil Co., San Francisco, importers of Chinawood oil. Stocks are being carried in the East.

Ford Motor Co. produced among its by-products in 1928, ammonium sulfate, valued at $814,259 and motor benzol, valued at $1,767,341. This compared with $703,412 and $971,958 respectively in 1927.

Chemical Foundation, Inc., gives Columbia University sufficient funds to meet cost of construction changes in the Department of Biological Chemistry.

Ansbacher Corp. Formed to Merge Color and Insecticide Interests

Ansbacher Corp. is chartered with capital of 1,600 shares of preferred stock, par $100, and 30,000 shares of no-par common, to consolidate the interests of the Ansbacher Color Corp. and the Ansbacher Insecticide Co., both of New York. Bernard R. Armour, F. William Weckman and Albert E. Waller are directors of the corporation. Bernard R. Armour was president and F. William Weckman, secretary of the Ansbacher Color Corp. which took over the dry color business of A. B. Ansbacher & Co. The former is also associated with the American Aniline Products Co., Heyden Chemical Co., and G. Siegle Corp. Albert E. Waller, vice-president and general manager, Ansbacher Corp., previously held same position in the Ansbacher Insecticide Co.

Cook, Swan & Young Corp. Sold

Sale of Cook, Swan & Young Corp., New York, to Gilbert P. Smith, president of the company, and J. Howard Smith, is ordered by New Jersey Federal Court. Title to property and assets of company, which has been in receiver's hands, is not to pass to these prospective purchases until April 15. Meantime the court will receive further bids for the properties and if such bids exceed the present offer of $245,000 and are accompanied by bond of $25,000, the court will defer naming successful bidder until April 19, when final decision as to disposal will be announced.

Nitrogen Engineering Corp., New York, makes ten-year contract with the Soviet Government to assist in construction and operation of a $10,000,000 factory to produce synthetic fertilizer, according to Amtorg Trading Co., New York. It was also said that fertilizer production would be increased from 300,000 tons in 1928 to 5,000,000 tons by 1933.

Shell Chemical Co., capitalized at £2,000,000, is incorporated in Delaware as a subsidiary of Shell Union Oil Corp. and the Royal Dutch Petroleum Co., to produce and sell new chemical processes of the Shell Development Co.

Patent Insurance Co., Hartford, said to be the first of its kind in the United States, is formed to insure patent owners against claims for infringements and indemnify them for damages, losses and expenses arising from patent litigation.

Atlas Powder Co. elects C. F. Backus and E. W. Moorehouse members of board of directors, succeeding W. J. Webster and William de Krafft, retired.

American Cyanamid Co. distributes booklet telling of the method by which nitrogen from the air is made into fertilizers and also giving directions for applying cyanamid.

Watab Paper Co., Sartell, Minn., makes first cornstalk newsprint which was subsequently used for the printing of the St. Cloud (Minn.) Times.

Du Pont Viscoloid Co., New York, issues a booklet telling of the processes involved in making together with uses for "Pyralin."

Wishnick-Tumpeer, Inc., is distributing to the trade on request, a booklet entitled "Review of Witco Advertising for 1928."

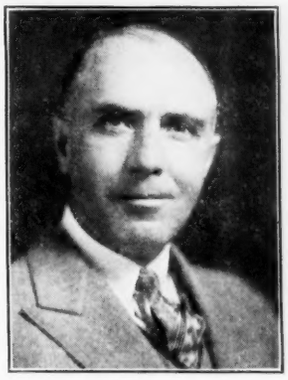
Solvay Sales Corp. issues the new edition of its Blue Book, an attractive handbook for users of alkalis.

Pfaltz & Bauer, Inc., New York, appoints Fred J. Mingst, assistant treasurer.

Kalbfleisch Corp. Announces Purchase of Wiarda Company

Kalbfleisch Corp. announces that as of April 1, it has purchased the capital stock of John C. Wiarda & Co., Brooklyn. The business of the latter company will continue to be conducted under the direction of George E. Taylor.

The Kalbfleisch Corp. held its Century Dinner, March 20, 1929 at the Fifth Avenue Restaurant, New York, in commemoration of the one hundredth anniversary of its establishment in March 1829. Hays H. Clemens, one of the directors of the company, acted as toastmaster, and the speakers were Alfred B. Savage, vice-president and treasurer of the company, who spoke on the "History of the Corporation"; James W. Prendergast, general counsel, who spoke on "The Kalbfleisch Corporation of To-day"; and Harry L. Derby, president, who spoke on the "Future of the Corporation." A letter was also read from Miss Augusta S. Kalbfleisch, a member of the board of directors and daughter of the late Franklin H. Kalbfleisch, former president of the company. Various entertainment features were also part of the program all of the arrangements for which were in charge of E. A. Schroeder.



Harry L. Derby
President, Kalbfleisch Corp.

Martin Kalbfleisch, founder of the business which to-day bears his name, was born in Holland in 1804. In 1892 he established a dry color plant in Harlem. Several years later he moved to South Norwalk, Conn., where some chemicals as well as colors were produced. About 1840, he located the first of his plants in Brooklyn. On the death of Martin Kalbfleisch, in 1873, Franklin H. Kalbfleisch, his son, continued the name in the industry. Subsequently, Franklin H. Kalbfleisch purchased various other units and consolidated them into the Franklin H. Kalbfleisch Co. which was later taken over by the present corporation.

The Kalbfleisch Corporation to day maintains six modern plans located in various sections of the country and mining operations and a plant in South America. Harry L. Derby is president and chairman of the board of directors.

In connection with its anniversary, the company has issued an attractive 84 page booklet, which is a handbook of the company's products, in addition to containing a history of the company.

Drug & Chemical Club, New York, elects following officers: president, Percy C. Magnus, Magnus, Mabee & Reynard; vice-president, John S. Turn; treasurer, John J. Powers, Charles Pfizer & Co.; secretary, Col. Frederick E. Humphreys, Humphreys Homeopathic Medicine Co.

Federal Trade Commission holds trade practice conference for the gypsum industry at Hotel Waldorf-Astoria, New York, March 28. Among practices discussed were price discrimination, misrepresentation, secret rebates, and irresponsible and untruthful statements concerning financial condition.

National Aniline & Chemical Co.'s Buffalo plant is partly wrecked by two explosions, March 13, which resulted is one death, a score of injuries, and damages reported at $350,000.

American Branch, India National Congress, New York, offers its services in encouraging import and export trade in chemicals between India and the United States.

American Cyanamid Secures U. S. Rights to British Moulding Powder

American Cyanamid Co. secures from British Cyanides Co., England, American rights for manufacture and sale in the United States of Beetle Moulding powder. Manufacture will be conducted at plant of the Calco Chemical Co., Bound Brook, N. J., and production is expected to begin in June. "Beetle" is said to be the first practical and successful urea-thiourea-formaldehyde moulding powder. It has been commercially used in Great Britain for the past two years, and its special feature is said to be the fact that it can be made in pure white, as well as in light and translucent colors.

Rogers-Pyatt Shellac Co. Sold

Rogers-Pyatt Shellac Co., Inc., New York, is sold to the banking group which has recently supervised the business, by reason of the acceptance of a bid of $1,450,000 by the Federal Court in settlement of the bankruptcy receivership which has maintained since January 4. Of this amount offered by the banking group, $850,000 represents claims of the bankers themselves. No opposition was registered to this sale of the plants and properties of the company.

Professor P. A. Tchekin, vice-president, Chemical Construction Corp., U. S. S. R. delivers a talk in Russian, March 18, before the Russian Association of Engineers, on the subject of "The Chemical Industry in the U. S. S. R.

Federal Aircraft Composition Co. is formed in Philadelphia to manufacture and sell a coating for outer surfaces of airplanes. Coating is new chemical process said to resist ice and snow.

C. H. Penning resigns as technical editor and chief of the information bureau, Chemical Catalog Co., to engage in commercial research for the Federal Phosphorus Co., Birmingham, Ala.

U. S. Vanadium Co. purchases holdings of Standard Chemical Co., Pittsburgh, comprising some 4,000 acres near Monterey, Col

J. B. Ford Sales Co. is formed in Michigan with capital of $10,000 to manufacture and sell cleaning materials.

Vanadium Corp. elects Matthew C. Brush and Charles E. Adams to board of directors.

Imperial Chemical House, Millbank, London, S. W. 1, the recently completed home of Imperial Chemical Industries. Although a good view of the building itself, this picture gives no idea of its picturesque setting on the bank of the Thames River, on the same side and quite close to Westminster Palace and the Abbey. Formal opening and inspection was held February 22, 1929.

Anglo-Chilean Nitrate To Join Centralized Sales Organization

Chilean Nitrate Producers' Association, at extraordinary general meeting, March 4, approves the following: to extend life of organization to June 30, 1929; to incorporate into the association the selling organization formed in August 1928; to incorporate in its membership the Anglo-Chilean Consolidated Nitrate Corp., New York, so that in the future all its production of nitrate will be sold under the rules of the association, except as regards the United States market.

Announcement was made on behalf of the Chilean Government that no efforts would be spared to help the nitrate industry increase its production and extend its markets. To contribute to this policy the Government will make use for the benefit of the industry of the ample powers which the Nitrate Law gives it. This is interpreted as meaning that the help which is being accorded the nitrate industry during the current year, estimated at about £2,000,000, will be increased in the future. Under the Nitrate Law, the Chilean Government has the power to subsidize the nitrate industry with any surplus receipts from nitrate and iodine duties over £4,250,000, of which amount iodine at present contributes £150,000, leaving a minimum to be obtained from nitrate of £4,100,000. On the basis of 2,756,000 tons shipped in 1928, duties received amounted to about £6,900,000 leaving a surplus of £2,800,000. If shipments reached 3,000,000 tons the surplus would be £3,425,000.

Treasury decision 38482-C of July 21, 1920, providing for the allowance of drawback on anilin dyes manufactured by American Aniline Products, Inc., New York, with the use of imported coaltar or anilin colors, as extended by T. D. 41721-H of July 15, 1926, to cover dyestuffs manufactured at its factory at Lock Haven, Pa., with the use of imported coaltar intermediates and sodium nitrate, has been further extended to provide for the allowance of drawback on purified orthoanisidin produced at its Lock Haven factory with the use of imported orthoanisidin, effective after March 19, 1928.

Rogers & McClellan, Boston, formerly New England agents for denatured alcohol produced by Seaboard Chemical Co., are now representing the Rossville Commercial Alcohol Corp., for the sale of their alcohol in that territory. The Boston company also announces its removal to new offices at 141 Milk st.

Neutralizing house of the powder plant of E. I. du Pont de Nemours & Co., Inc., near Gibbstown, N. J., is wrecked by an explosion March 26, resulting in the death of two employees who were in the house at the time, and considerable damage.

Food, Drug and Insecticide Administration determines that the name "Buttercup Yellow" is not proper for a coal-tar dye, and the manufacturers have changed the name to "Sunset Yellow F. C. F."

Le Roy Ferris is appointed assistant secretary, Industrial Alcohol Institute, New York. His previous associations have been in the retail and wholesale phases of the automotive industry.

African & Eastern Trading Co. and the Niger Co., both of London, plan to merge. Two companies are said to be the largest and the oldest in the African palm oil industry.

Pfaltz & Bauer, Inc., takes over agency for lignisalvor, an imported wood preservative formerly distributed by Wm. Menzel & Co., New York.

Chicago Drug & Chemical Association elects following officers: president, O. N. Davis; vice-president, R. A. Whidden; secretary, J. A. Gauer; treasurer, Euclid Snow.

The Financial Markets

Allied Chemical & Dye Corp. Reports Net of $11.11 Share

Net Income of $11.11 Compares With $10.02 In Previous Year — U. S. Industrial Alcohol Also Reports Higher Net of $10.29 As Compared With $7.26 in 1927—American Cyanamid Plans Recapitalization and United Chemicals Offers Common Stock.

Report of Allied Chemical & Dye Corp. and subsidiaries for year ended December 31, 1928, shows net income of $26,962,441 after depreciation, federal taxes, etc., equivalent after preferred dividends to $11.11 a share earned on 2,178,109 shares of no-par common stock. This compares with $24,586,872 or $10.02 a share in 1927. Surplus after dividends was $11,143,844 against $8,768,275 in previous year.

After payment of preferred and common dividends aggregating $15,818,597 last year, $11,143,845 was added to surplus, bringing this account up to $181,825,818 on Dec. 31. Total assets listed in the balance sheet were $366,616,796. Current assets, at $140,443,569 were more than fourteen times the current liabilities of $9,950,790. The assets shown represented an increase for the year of $17,062,220. Property account was $196,699,900, while investments, chiefly bonds and stocks of other companies, were $7,377,332. The current assets included: Cash, $15,097,408; securities, $82,710,580; accounts and notes receivable, $16,864, 353; inventories, $25,771,226. Deferred charges of $790,052 and patents, processes, trade-marks and good-will valued at $21,305, 942 make up the balance of the assets.

Liabilities listed by contra account include, besides the surplus, reserves totaling $124,664,742 The items in this account include reserves for depreciation and obsolence totaling $104,374,094, an increase during the year of $5,197,121. Other reserves are: General contingencies, $12,340,438; taxes, $3,341,680; insurance, $2,224,893, and sundry, $2,383,634.

Capital stock is carried in the balance sheet at $50,175,445, the preferred stock, consisting of 392,849 shares of $100 par value each, amounting to $39,284,900, while the 2,178,109 common shares of no par value are carried on a $5-a-share basis, or a total of $10,890,545.

U. S. Industrial Alcohol Net Higher

U. S. Industrial Alcohol Co. for the year ended Dec. 31, 1928, reports net income of $3,295,184 after depreciation, Federal income taxes and dividends on the preferred stocks of the company and the Cuba Distilling Co., equivalent to $10.29 a share earned on 320,000 shares outstanding as of Dec. 31, 1928. This compares with $1,741,989, or $7.26 a share, on the 240,000 shares outstanding in the preceding year.

In October action was taken to change the capital structure, which resulted in the offering to stockholders of 80,000 additional shares of common. Funds obtained were for the retirement of the preferred stocks of the company and of the Cuba Distilling Co. At the end of the year 18,000 shares had been redeemed. Russel R. Brown, president, in his remarks to stockholders, said that had it been possible to redeem the preferred and issue the additional common by Jan. 1 the earnings, after allowing for preferred dividends, would have amounted to $3,275,999 available for the 240,000 shares of common, equivalent to $13.64 a share.

American Cyanamid Co. Plans to Recapitalize for Expansion

American Cyanamid Co. plans recapitalization, whereby authorized common will be changed to no-par from $20 par, and increased to 1,600,000 shares from 1,000,000. Common stockholders of record May 14 are offered right to subscribe to one class B common share for every three shares class A or B common held at $20. Rights expire June 17. Holders of six per cent. preferred are offered right to exchange each share held for two common shares. Company will continue present dividend rate of 30 cents regular quarterly and ten cents extra quarterly on the increased common. Exercise of all rights by common stockholders would increase outstanding common to about 1,158,000 shares of class A and class B, and conversion of preferred would add about 112,000 shares.

Offering to common stockholders would bring in about $6,131, 180 in new money, which would be used for further plant expansion and alterations to continue the company's major expansion program now under way. This is the third time within the past 12 months that the company has offered rights to stockholders.

Work now underway will increase output of the Niagara Falls plant to 355,000 tons of cyanamid annually, against a production of 136,000 tons in the fiscal year ended June 30, 1928. Production of Ammo-Phos will be increased to 250,000 tons, against 60,000 tons in the last fiscal year.

United Chemicals Offers Common to Holders of $3 Preferred

United Chemicals, Inc., offers holders of its $3 participating preferred stock the right to subscribe to 20,000 shares of United Chemicals common at $100 a share, in the ratio of one share for each six shares of preferred held. An offering of 20,000 additional shares of common has been privately sold at $115 a share by a banking group. This is stock purchased from the management and does not represent new financing.

First annual report of International Printing Ink Corp. and subsidiaries, for year ended December 31, 1928, including the results of the operations of predecessor companies to May 31, shows combined net profit of $1,829,787 after depreciation. interest, provision for employes' bonuses and federal taxes, equivalent after 6% preferred dividends, to $5.22 a share earned on 270,173 no-par shares of common stock.

Report of Columbian Carbon Co. and subsidiaries for year ended December 31, 1928, shows net profit of $2,991,362 after depreciation, depletion, federal taxes, etc., equivalent to $6.76 a share earned on 442,344 no-par shares of stock. This compares with $2,032,962 or $5.05 a share on 402,131 shares in 1927,

Report of Vanadium Corp. of America and subsidiaries for year ended December 31, 1928, shows net income of $1,706,024 after federal taxes, depreciation, depletion, etc., equivalent to $4.53 a share earned on 376,637 no-par shares of capital stock. This compares with $1,849,240 or $4.91 a share in 1927.

Koppers Gas & Coke Co. declares regular quarterly dividend of $1.50 on preferred stock, payable April 1 to stock of record March 11.

A block of class B stock of American Cyanamid Co. has been privately placed by Lehman Brothers and Spencer Trask & Co.

Union Carbide Plans Increase in Capital Stock with 3 for 1 Split-up

Union Carbide & Carbon Corp. stockholders will vote April 16 on increase in authorized capital stock to 12,000,000 no-par shares from 3,000,000 and issuance of three new shares for each old share held. Portion of the increased shares which is not now to be used in the three-for-one split-up will be available for issuance from time to time as and when authorized by the board of directors.

Report of Union Carbide & Carbon Corp. and subsidiaries, for the year ended December 31, 1928, shows net income of $30,577,382, after federal taxes, depreciation, depletion, interest, and subsidiary preferred dividends, equivalent to $11.15 a share earned on 2,742,072 shares of no-par stock. This compares with $25,340,660, or $9.52 a share, on 2,659,733 shares in 1927.

Heyden Chemical Reports Net of $2.02 Per Share Against $1.01 in 1927

Report of Heyden Chemical Corp. for year ended December 31, 1928, shows net income of $425,107 after interest, federal taxes, etc., equivalent to $104.87 a share on 3,100 shares (par $100) of 7% cumulative preferred stock on which there are accumulated unpaid dividends. Allowing only for regular annual dividend requirements on preferred stock, balance is equal to $2.02 a share on 150,000 shares (par $10) of common stock. This compares with $174,152 or $56.18 a share on preferred and $1.01 a share on common in 1927.

Glidden Co. offers common stockholders the right to subscribe to 100,000 additional shares of common stock at $35 a share in the ratio of one share for every five shares held. Company reports for quarter ended January 31, 1929, net profit of $379,410 after charges and federal taxes, equivalent after dividend requirements on $6,916,700 of 7% prior preferred stock, to 51 cents a share earned on 500,000 no-par shares of common stock. This compares with $205,381 or 16 cents a share on common figured on same share bases in corresponding quarter of previous year.

Royal Baking Powder Co. and subsidiaries for year ended December 31, 1928, report net profit of $1,265,203 after depreciation, federal taxes and other charges, equivalent after preferred dividends, to 83 cents a share on 800,000 no-par shares of common stock. This compares with $1,487,431, or $1.11 a share, in 1927, based on present share basis.

Celluloid Corp. reports for year ended December 31, 1928, net profit of $591,957 after depreciation, etc., equivalent, after payment of dividends on the two classes of preferred stock and after deducting from the balance the 10% due the participating preferred stockholders, to $1.17 a share earned on 194,951 no-par common shares.

Report of Corn Products Refining Co. for year ended December 31, 1928, shows net income of $13,192,974 after interest, depreciation, federal taxes, etc., equivalent after preferred dividends, to $4.52 a share (par $25) earned on 2,530,000 shares of common stock. This compares with $11,905,289, or $4.01 a share in 1927.

By-Products Coke Corp. declared an extra dividend of 50 cents and the regular quarterly dividend of 50 cents, both payable March 25 to stock of record March 11. Last quarter an extra dividend of 75 cents was paid.

International Combustion Engineering Corp. declares the regular quarterly dividend of $1.75 on the preferred, payable April 1 to stock of record March 20.

Tennessee Copper & Chemical Makes $3,358,700 New Bond Issue

Tennessee Copper & Chemical Corp. issues $3,358,700 of fifteen-year six per cent. convertible debenture gold bonds, series B, due March 1, 1944. Bonds are convertible into common stock in ratio of one share for every $20 of the principal until February 28, 1930, $22 until February 28, 1931, and $24 until February 29, 1932, after which privilege expires. Provision will be made for sinking fund sufficient to retire 61 per cent of the series B bonds before maturity.

According to a statement by E. H. Westlake, vice-president, "Tennessee Copper and Chemical Corp. through a subsidiary owns and operates the largest plant in the United States for the production of sulfuric acid. The business originally started in 1899. The copper mines, smelter and acid plants are located at Copperhill, Tennessee. Fertilizer plants are located at East Point (Atlanta), Georgia; Lockland (Cincinnati), Ohio; New Albany, Indiana; Montgomery, Alabama, and Tampa, Florida. A fleet of 373 tank cars is owned and used for the conveyance of acid between the various plants, as well as to the trade in general. The plants are advantageously located geographically. Present operations include the manufacture of sulfuric acid of various grades, superphosphate, mixed fertilizer, copper, iron sinter and copper sulfate. During 1928 over 400,000 tons of sulfuric acid, approximately 13,500,000 pounds of copper and about 70,000 tons of iron sinter were produced.

"These bonds will represent the company's total funded debt, and the consolidated balance sheet, adjusted to give effect to present financing, shows net tangible assets applicable to these bonds of $5,898 per $1,000 bond, and a ratio of assets against current liabilities slightly better than ten to one. Net income available for interest after depreciation and before interest charges and Federal taxes amounted to $1,357,260 or 6.73 times the annual interest charges on these bonds for the year ended December 31, 1928, as against the past five-year average of 4.18 times."

I. C. I. Nets $25,333,737 in 1928

Imperial Chemical Industries, Ltd., in its preliminary report for 1928, shows a net profit of $25,333,737 after deductions for income tax. This compares with $21,587,599 for 1927. After dividends of $20,342,745 on preference, ordinary and deferred shares, the company carried to its general reserve $4,860,000. At the end of 1927, after dividends of $19,198,152, it carried to its reserve $1,987,623. Earnings on the ordinary shares, after deduction for taxes and appropriation for reserves, amounted to more than 10 per cent. A final dividend of five per cent. has been declared on the ordinary shares, making total payments for the year 8 per cent., the same as for 1927.

Corn Products Refining Co. declares the regular quarterly dividends of 50 cents on the common, payable April 20 to stock of record April 1, and $1.75 on the preferred, payable April 15 to stock of record April 1.

Merrimac Chemical Co. declares regular quarterly dividned of $1.25, payable March 30 to stock of record March 16.

Air Reduction Co. declares the regular quarterly dividend of 50 cents, payable April 15 to stock of record March 30.

Freeport Texas Co. declares regular quarterly dividend of $1, payable May 1 to stock of record April 15.

Will & Baumer Candle Co., Inc., declares the regular quarterly dividend of $2 on the preferred, payable April 1 to stock.

Snia Viscosa reports profits of 72,000,000 lire for 1928, which has been put to reserves.

The Industry's Stocks

1929 Mar. 28 Bid	1929 Mar. 28 Asked	1929 High	1929 Low	1928 High	1928 Low	Sales In Mar.	Sales Since Jan. 1	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1928	Earnings $-per share-$ 1927
								NEW YORK STOCK EXCHANGE					
103¼	102½	114⅝	96⅞	99½	59	47,200	201,100	Air Reduction	No	683,873	$2.00	9 mo. 3.70	10.74
278	270½	305¾	241	252¾	146	96,900	267,200	Allied Chem. & Dye	No	2,178,109	6.00		10.03
121½	121	123½	121			3,500	7,400	7% pfd	100	392,849	7%		62.59
17⅞	17½	23⅜	14½	26	15⅝	27,000	87,300	Am. Agricultural Chem	100	333,221	...		1.59
60	60	73½	53½	79⅞	55⅝	20,400	56,700	pfd	100	284,552	...		7.86
124½	119⅜	129	107½	117½	70½	1,772,100	2,901,400	American Can	.25	2,473,998	3.00		4.11
142	141	142	140⅝	147	136½	4,300	9,900	pfd	100	412,333	7%		31.66
64⅜	62⅜	81½	55½	63¾	39	176,300	1,056,300	American Metal, Ltd	No	595,114	*3.00	9 mo. 2.30	3.64
123	121½	135	117	117½	109	2,800	17,500	pfd	100	99,907	6%	9 mo. 18.92	50.27
113½	112	124¾	93½	293	169	558,000	1,427,000	American Smelt. & Refin	100	609,980	4.00	6 mo. 10.61	19.64
135⅜	135⅜	138	135½	142	131	5,200	10,900	pfd	100	500,000	7%	6 mo. 16.44	30.96
41⅜	38⅜	49½	30⅜	57	6⅜	272,100	347,100	Amer. Zinc & Lead	25	193,120	...		...
101½	101	111½	98½	117⅞	40	14,300	24,500	pfd	25	96,560	...		d2.72
160	156½	174⅛	115½	120½	53¾	5,920,000	10,442,400	Anaconda Copper Mining	50	3,302,817	6.00		3.37
41½	40½	49½	36½	112⅞	55¼	135,600	213,700	Archer Dan. Mid	No	213,712	4.00	7.34	5.77
115	114½	115	114			540	1,020	pfd	100	43,000	7%	46.94	37.39
97	97	115	92	114	63	10,600	50,000	Atlas Powder Co	No	261,438	4.00	6.30	5.75
...	...	106½	100	110½	102	560	1,880	pfd	100	90,000	6%	6 mo. 10.83	22.71
64⅞	63¼	68	53½	66½	50	824,600	1,468,000	Atlantic Refining	25	500,000	1.00	9 mo. 21.72	1.83
8	7½	9½	7	12¼	4¼	75,900	166,100	Butte Copper & Zinc	5	600,000	...		0.10
9	8½	12⅜	8½	16¼	8⅜	20,000	78,600	Butte Superior Mng	10	290,198	2.00	9 mo. 0.16	0.94
113	113	129⅜	104½	122	65	10,800	69,100	By Product Coke	No	189,936	*5.00	9 mo. 5.78	5.68
3½	3½	4	3	5⅜	1⅜	40,900	138,900	Calla Lead & Zinc	10	724,592	...	9 mo. ...	0.10
54½	52½	61⅞	42½	47⅜	20⅜	544,300	1,444,800	Calumet & Hecla	25	2,005,502	2.50	9 mo. 0.95	0.29
20½	20¼	28⅜	20	119	61½	22,000	63,000	Certainteed Prod	No	400,000	...	9 mo. ...	5.31
50	50	81½	50	63½	23½	1,100	3,300	7% pfd	100	62,904	7%	9 mo. 0.87	56.80
118	115½	127½	71⅜	74⅞	37⅜	136,800	1,295,900	Chile Copper	25	4,415,497	3.00	6 mo. 1.96	2.51
133	131	154⅞	121½	134⅜	79	60,500	180,900	Columb Carbon	No	402,131	...	9 mo. 5.24	4.83
265	260	283	225¼	250½	137⅞	67,600	149,300	Commercial Solvents	No	217,722	8.00	13.19	9.25
76⅜	74½	80⅛	60	64⅜	53	619,200	1,118,600	Cont. Can	No	1,420,000	5.00		7.21
125	125	126	124½	128	123	60	260	pfd	100	51,125	7%		86.82
85	83½	91⅞	82	94	64⅜	62,200	206,300	Corn Products	25	2,530,000	2.00	9 mo. 3.00	3.50
141½	141⅛	144⅜	141½	146⅜	138½	930	3,630	pfd	100	250,000	7%	9 mo. 35.63	42.40
57⅜	55⅛	69½	49	68¼	34⅜	262.000	689.100	Davison Chem	No	480,000	...		6.21
56	55½	64⅞	53½	61	40	17,400	77,500	Devoe & Rayn A	No	110,000	2.40	6 mo. †5.95	†5.03
...	114½	115½	112	120	108	560	1,060	1st pfd	100	17,473	7%	6 mo. 34.71	53.23
117¾	117½	118⅞	115⅜	121½	114	5,300	11,600	Dupont deb	100	904,539	6%	9 mo. 57.79	57.03
182	179	198½	155¾	503	310	180,300	337,300	Dupont de Nemours	No	2,661,658	*14.75	20.89	15.45
179	179	194½	172	194½	163	13,900	71,900	Eastman Kodak	No	2,057,560	*8.00		9.61
128	126½	128	126	132½	123½	470	750	pfd	100	61,657	6%		326.68
300	265	310	234	230	120	300	4,700	Fed. Mining & Smelting	100	50,400	...		23.36
73	71⅞	84⅜	68⅜	89⅜	65	252,600	541,900	Fleischmann	No	4,500,000	*5.00	9 mo. 3.24	4.30
47⅛	45	54⅞	38	109½	43	85,500	332,900	Freeport Texas	No	729,844	4.00	4.49	5.12
68	65½	81⅛	61	94⅞	141½	54,800	145,900	General Asphalt	100	206,887	...	6 mo. ...	4.74
106½	106½	120½	104½	150	132	5,800	12,900	pfd	100	68,742	5%	6 mo. d5.09	19.34
42⅜	42	45	36⅞	37	20⅜	141,000	447,800	Glidden Com	No	500,000	*2.00	3.37	2.88
104½	104	105¼	103½	105	95	660	2,920	prior pfd	100	69,167	7%	32.69	23.91
64½	63	82	54⅛	143¼	71	510,200	2,086,600	Gold Dust	No		2.50		8.97
69½	69⅛	79½	65½	84	64½	7,600	35,900	Household Prod	No	575,000	*4.00	6 mo. 2.64	5.22
14	13⅛	17⅞	12⅜	20⅞	13	16,300	50,300	Intern. Agri	No	450,000			1.34
83	81	88½	79½	85	48⅜	1,600	8,600	pfd	100	100,000	7%		13.03
52⅞	48	72¾	40½	46	41½	2,565,800	6,772,600	Intern. Nickel	No	1,673,384	3.00	9 mo. 4.72	3.30
56⅜	53½	63	52	60	47½	10,000	43,000	Int. Print Ink	No	256,022	2.50	6 mo. 2.58	4.98
80	76	90⅜	55½	69	49⅜	1,770	11,470	Intern. Salt	100	60,771	...	6 mo. 0.05	5.38
174⅜	168½	242½	155¼	202	96½	472,200	1,255,500	Johns-Mansville	No	750,000	3.00	9 mo. 4.94	4.78
79⅜	77	113⅞	71⅜	124½	63½	76,100	197,000	Liquid Carbonic Corp	No	125,000	4.00	7.05	5.90
107	107	107	104	57¼	45	4,700	16,400	Mac and Forbes	No	378,500	*3.50	9 mo. 2.34	3.62
192	192	218	172	190	117½	16,100	30,400	Mathieson Alk	No	147,207	6.00	9 mo. 9.54	10.93
124	123½	125	120	130	115	220	960	pfd	100	24,750	7%	9 mo. 63.03	74.06
49	47½	54½	30½	33	17½	517,300	941,400	Miami Copper	5	747,116	2.00		1.53
43⅞	39¼	55½	33	58½	29½	276,100	356,700	National Dist. Prod	No	168,000	...		...
				71⅜	51½			pfd	No	107,720	...		0.55
77½	76	86½	67½	...	...	31,900	62,200	pfd. tem. ctfs	...	...	...		...
160	155	173	132	136	115	43,300	112,900	National Lead	100	309,831	5%		8.90
44	43	44	43					Newport Co	50	130,000			
51⅜	48½	55⅜	38	41½	22⅜	142,300	296,700	Penick & Ford	No	433,773	...	9 mo. 1.32	1.76
272½	272½	287½	208	217	157	20,600	61,700	Peoples Gas Chi	100	511,521	8%	9 mo. 8.98	10.81
33	31½	43½	30			44,600	88,800	Royal Baking, new com	100	800,000	1.00	6 mo. 0.53	1.14
100	100	103½	99½			800	800	pfd	100	100,000	6%	6 mo. 7.26	15.11
75	73½	94	62	71½	37	566,100	1,504,500	St Joseph Lead	10	1,950,509	*3.00		2.06
59⅜	57⅜	59⅜	48	59⅜	37⅜	980,400	1,789,700	Standard Oil Co. of N. J.	25	24,419,219	*1.50		1.52
44⅜	43½	45⅜	38	45½	28⅜	619,900	2,326,000	Standard Oil Co. of N. Y.	25	17,118,931	1.60		0.67
18½	18½	20⅜	16½	19⅞	10½	152,600	459,600	Tenn. Cop. & Chem	No	794,626	1.00		0.51
80⅜	76⅜	82	72½	82½	62⅛	552,200	1,294,200	Texas Gulf Sulfur	No	2,540,000	4.00	5.72	4.76
220	216½	228	196½	209	186½	419,300	1,194,400	Union Carbide	No	2,742,072	6.00	9 mo. 7.16	9.53
142⅞	140	154½	128	138	102½	113,900	436,600	U. S. Ind. Alc	No	240,000	6.00	6 mo. 3.90	7.26
125½	125½	125⅞	124½	125⅞	118⅜	150	810	pfd	100	60,000	7%	6 mo. 19.12	36.03
96⅜	93⅜	116½	83½	111½	60	218,400	850,900	Vanadium Corp	No	376,637	*4.00	6 mo. 2.57	4.97
18½	17	24⅜	15½	20⅜	12	82,000	369,700	Virginia Car. com	No	486,700	...	0.69	...
54¾	53½	65½	52	64½	44⅜	21,720	71,920	6% pfd	100	213,392	...	7.57	d5.41
91	89	97½	90	99½	88½	1,600	5,200	7% pfd	100	125,000	7%	20.09	d1.70
High	**Low**							NEW YORK CURB					
...	...	23	17½	31½	16½	900	6,400	Acetol Prod	No	60,000	2.40		8.69
...	...	43½	33½	42⅜	33½	4,500	13,100	Agfa Ansco	No	300,000	...		
160	160	189	146	197½	120	10,300	26,400	Aluminum Co. of America	No	1,472,625	...		3.28
...	...	107	103½	110½	104	3,000	7,200	pfd	100	1,472,625	6%		9.28
80	78½	87	74	87⅞	74	14,300	40,000	Amer. Com. Alc	No	77,000	...	3 mo. 2.66	...
59⅜	57½	80	50½	65	30¾	158,800	389,300	Amer. Cyan	20	428,465	8%	†3.67	†2.92
...	...	...	...	24	13		14,800	Amer. Rayon Prod	No	123,500	...	15 mo. ...	
36	36	40½	26½	28½	11⅜	29,700	112,600	Amer. Sol. & Chem. com	No	160,000	...	1.58	0.07
...	...	55½	46½	47⅞	25½	12,000	55,000	pfd	No	100,000	...	6.52	3.17
44⅞	44½	45½	33	54	26½	35,000	73,200	Anglo Chile Nitrate	No	1,756,750	...	6 mo.. ...	...
6¾	6½	8⅞	4⅜	33½	7	17,600	45,400	Br. Celanese	No	2,650,000	...	0.55	...
38	33	43½	34	46½	41	700	1,000	Canad. Ind. Alc	No	1,092,915	1.52	†2.87	†2.49
...	...	267	180	226	156	1,220	3,920	Casein Co	100	21,196	*9%		7.98
46	43⅜	57½	41½	103	36½	26,900	59,100	Celanese Corp. of Am	No	1,000,000	...		1.72
40½	40½	50	40	122	34	1,000	3,100	Celluloid Co	No	194,952	...		0.87
...	...	110	100	132	103½	900	2,000	1st pfd	No	23,882	7.00		11.94
...	...	...	...	97½	75	500	600	7% pfd	No	24,551	7.00		9.96
...	...	...	...	73½	49		2,360	Celotex pfd	100	52,532	7%	26.28	15.55
73	71½	80½	71½	92	75	7,300	20,800	Colgate-Palmolive Peet			2.00		
...	...	...	...	...	...			Courtaulds	£1	12,000,000	22½%		26.55%
19½	19½	25½	18⅛	24⅞	20	7,900	22,100	Am. dep-rects	...	...	...		...

1929 Mar. 28 High	1929 Mar. 28 Low	1929 High	1929 Low	1928 High	1928 Low	Sales In Mar.	Sales Since Jan. 1	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1928	Earnings $-per share-$ 1927
...	...	...	...	380	192	380	1,730	Hercules Powder	No	147,000	14%	22.04	16.36
119	118	121¾	115	125	118½	170	550	pfd	100	114,241	7%	9 mo. 24.69	28.05
...	...	24⅝	19½	23	7½	1,200	4,800	Heyden Chem.	10	150,000	...		1.02
...	...	27	23	98	38½	200	1,200	Monroe Chem.					
...	...	130	118	...	...	100	200	Monsanto Chem.	No	110,000	2.50	9 mo. 6.30	6.11
...	...	...	...	...	...		349	Penn Salt	50	150,000	5.00	8.27	8.09
7¼	7¼	9¼	7⅜	9⅜	6½	3,700	21,400	Pyrene Mfg.	10	219,470	.80		0.70
...	...	88⅜	81	...	...	475	1,185	Sherwin Williams	20	594,445	4.00	6.99	6.42
42	40½	48½	23½	111½	103	226,900	307,800	Silica Gel	No	600,000	...		
...	...	6½	5½	92	65½	900	1,400	Snia Viscosa	120 lire	8,333,333	...		3.01 lire
...	...	4⅞	4⅞	29	17	100	200	dep-recpts.	...	...	...		...
...	...	...	...	9¾	6½		29,000	Spencer Kellogg	No	500,000	1.60	3.59	2.37
131	131	139½	129½	10	5⅞	3,350	15,650	Swift & Co.	100	1,500,000	8%	9.87	8.13
390	399	550	380	42	31½	4,500	8,400	Tubize "B"	No	78,858	10.00		
52	50⅛	61½	44	150½	125	11,300	24,900	United Chem., pfd.	50	120,000	3.00		
...	...	115	115	630	450	82,200	182,200	com.	No	102,000			
62½	60	73	56	100	53⅜	78,700	156,900	U. S. Gypsum	20	691,502	1.60	6 mo. 4.42	10.08
93	91⅜	116½	47¾	...	...	100	100	Westvaco Chlorine Prod.	No	200,000	2.00	3.60	
								CLEVELAND					
195	195	220	135	147½	104	1,618	2,753	Cleve-Cliff Iron	No	400,000	4.00		9.74
...	...	270	200	225	112½	107	441	Dow Chem.	No	120,000	6.00		
107	107	...	...	107	103⅜	73	199	pfd.	100	30,000	7%		
...	...	...	...	...	...		20	Glidden	No	500,000	*2.00	3.37	2.88
...	...	105	103	104¾	96	665	1,150	prior pfd.	100	69,167	7%	32.69	23.91
...	...	88	83	95	65½	881	3,349	Sherwin Williams	25	594,445	4.00	6.99	6.42
106	106	108	104½	109½	106	622	1,766	pfd.	100	125,000	6%	39.21	37.82
...	...	29	26½	28	24¾	520	1,430	Wood Chemical Prod. "A"	No	20,000	2.00		7.75
								CHICAGO					
...	...	26½	18	96	91½	1,550	16,405	Monroe Chem.	100	167,500	...		4.74
128	128	130	104	146	127½	6,700	16,000	Monsanto Chem.	No	110,000	2.50	9 mo. 6.30	6.11
132	132	140	129	...	...	6,570	17,770	Swift & Co.	100	1,500,000	8%	9.87	8.13
60	59	72½	55	...	...	18,150	19,650	U. S. Gypsum	20	691,502	1.60	6 mo. 4.42	10.08
52	51	60⅞	45	100	55	47,750	48,350	United Chemicals, pfd.	50	120,000	3.00		
								CINCINNATI					
...	...	...	...	...	...	72	77	Fleishmann pfd.	100	12,200	6%	9 mo. 1,197.09	1,589.49
350	347	375	279	300	249	3,799	14,899	Proc. & Gam.	20	1,250,000	8.00	11.96	11.38
								PHILADELPHIA					
...	...	97½	92	109½	92	2,000	4,900	Penn. Salt	50	150,000	5.00	8.27	8.09
168	165⅛	195¼	157	173½	114¼	288,585	862,785	United Gas Imp.	50	3,903,791	6.00		6.28
								MONTREAL					
13½	13	...	...	...	...	11,919	26,319	Asbestor Corp.	No	200,000	...		0.87
...	...	...	...	...	...	2,719	6,419	pfd.	100	74,564	7%		9.32
37½	36	...	...	..	...	37,609	109,209	Canada Ind. Alc.	No	1,092,915	1.52	†2.87	†2.49
78	75½	...	...	.	...	47,103	146,603	Shawinigan W. & P.	No	1,844,700	2.00		2.41
								BALTIMORE					
...	...	...	...	28¾	17	2,467	5,067	Silica Gel	No	600,000	...		
Bid	**Asked**							UNLISTED					
85	83	...	...	80	70			Agfa Ansco, pfd.	100	50,500	...		...
115	108	...	...	375	190			Hercules Powd., com.	No	147,000	14%	9 mo. 15.10	16.36
78	74	...	...	82	64			Merck. & Co., pfd.	100	33,950	...		...
...	...	...	...	169	116			Newport	1	929,498	...		0.19

*Includes extra dividends. †Class A and class B shares combined. d Deficit.

The Industry's Bonds

1929 Mar. 28 High	1929 Mar. 28 Low	1929 High	1929 Low	1928 High	1928 Low	Sales In Mar.	Sales Since Jan. 1	ISSUE	Date Due	Int. %	Int. Period	Orig. (1) Offering $
								NEW YORK STOCK EXCHANGE				
104⅜	104	106½	104	106¾	104	108	321	Am. Agri Chem.	1941	7½	F. A.	30,000
94½	94½	96½	93¾	97	92	207	514	Amer. Cyanid	1942	5	A. O.	
103¾	100½	102	100	102¾	99¾	286	674	Am. Smelt & Refin "A" 5%	1947	5	A. O.	...
98½	97½	100	94½	105⅛	92	385	1,428	Anglo Chilean	1945	7	M. N.	16,500
100½	100	102½	100	103¾	99⅞	98	267	Atlantic Refin.	1937	5	J. J.	15,000
100	100	102	100	103½	100	27	82	By product Coke	1945	5½	M. N.	8,000
101	101	103	99½	103⅛	100	7	10	Corn Product Refin.	1934	5	M. N.	10,000
105	105	109½	103	117	106	124	177	General Asphalt	1939	6	A. O.	5,000
95	90⅜	95	90⅜	95⅜	89½	10	28	Int. Agric. Corp.	1932	5	M. N.	30,000
80½	77¼	81½	77¼	86½	77	19	36	Int. Agri. Corp. stamped. extended	1942	5	M. N.	7,020
				205	113			Liq. Carbonic Corp.	1941	6	F. A.	5,000
112¾	112¾	127	112	...	...	137	1,025	Montecatini	1937	7	J. J.	
94½	94½	95	93	...	...	277	854	Ex War.	1937	7	J. J.	
115	111½	115	111½	...	...		3	People's Gas & Coke	1943	6	A. O.	10,000
104	104	105½	104	108½	102	54	174	Refunding	1947	5	M. S.	40,000
102	101	103¾	101	104	102	551	1,275	Standard Oil N. J.	1946	5	F. A.	120,000
106⅜	106½	114	104	120	101½	63	316	Tenn. Cop. and Chem.	1941	6	A. O.	3,000
79	74	82	74	91⅞	82	13	44	Va. Iron C. & C.	1949	5	M. S.	
								NEW YORK CURB				
101¾	101½	102½	100	103½	100	513	910	Alum. Co. of Am 52	1952	5	M. S.	
124½	122½	132	115¾	121½	98	513	1,171	Amer. Com. Alc.	1943	5	M. N.	
116⅝	116⅛	122	114	125	99	450	1,276	Amer. Solv. & Chem.	1936	6	M. S.	
				101⅞	99⅜			Anaconda Cop.	1929	6	J. J.	25,000
100	99⅜	100	98	101¼	97½	566	1,065	Koppers Gas and Coke	1947	5	J. D.	25,000
...	...	101	99½	103½	98	20	127	Natl. Dist. Prod.	1935	6½	J. D. 15	3,500
93	93	94½	91⅜	98⅞	93½	221	515	Shawinigan W & P.	1967	4½	A. O.	
...	...	112¼	101	106⅜	100	127	146	Silica Gel. 6½% with warr.	1952	6½		
96½	95½	98⅜	95½	100	95	39	135	Solvay Am. Invest. Corp.	1942	5	M. S.	15,000
99⅜	98¾	100¼	98⅝	101½	99⅜	367	818	Swift & Co.	1932	5	A. O.	50,000
102	102	104	99½	104	99½	81	190	Westvaco Chlorine Prod.	1937	5½	M. S.	2,500

The Trend of Prices

Industry and Trade Continue Active During Past Month

Preliminary Reports For March Indicate That Industrial Activity Which Characterized the New Year Has Continued — Chemical Trade Active — New Acetone Producer in Field — Many Commodities in Short Supply.

The industrial activity which characterized the opening of the New Year continued through February and March. Industry and trade continued active in February and the first part of March, and there was a growth in the volume of bank loans. Borrowing at Reserve banks increased during the period and money rates advanced further, according to the monthly survey of business and finance of the Federal Reserve Board.

Production continued at a high rate throughout February and the first half of March and was substantially above a year ago. Automobile output was at a record rate in February, and there was also an unusually high daily average production of copper and iron and steel. Large output in the iron and steel industry reflected demands from manufacturers of automobiles, machine tools, and agricultural implements, and from railroad companies. Preliminary reports for the first half of March indicate further expansion in automobile and iron and steel production.

During February the daily average output of coal and crude petroleum also increased, and production of cotton and wool textiles continued large, while silk output declined somewhat from the unusually high level of January There was also some decline from January in the production of lumber and cement, and in the output of meat-packing companies.

In February shipments of commodities by rail increased more than is usual for the season, reflecting larger loadings of coal and coke and miscellaneous freight, which includes automobiles. During the first two weeks of March, freight-car loadings continued to increase.

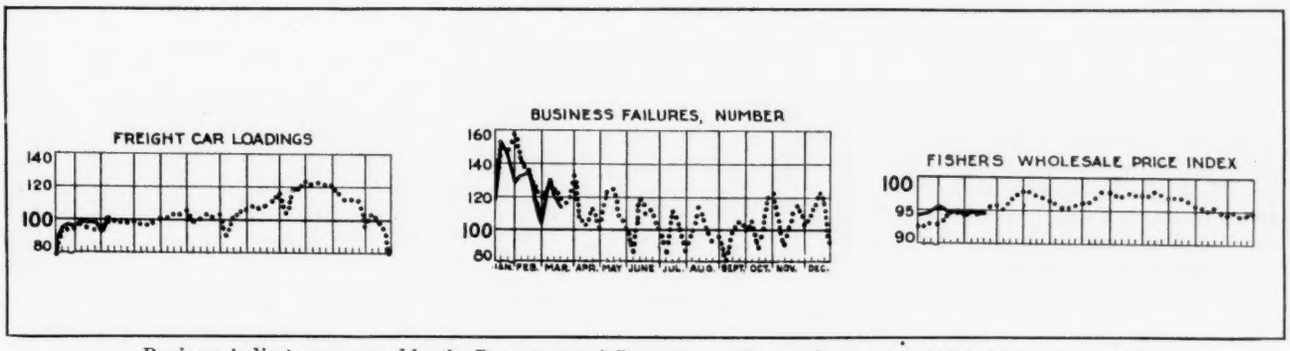
The general level of wholesale prices declined slightly in February, and was approximately the same as a year ago. The decline from January reflected primarily decreases in the prices of hides and leather, livestock, and meats, and small declines in the prices of wool, cotton and woolen goods. The influence of these declines on the general average was partly offset by increases in the prices of copper, lead, iron and steel, rubber, and grain.

During the first two weeks of March, prices of wool and petroleum continued to decline, and rubber prices receded somewhat after a marked rise in February, while leather prices declined sharply. Prices of copper rose further and there were small increases in prices of hides, raw cotton, and certain grades of lumber.

Activity in the chemical trade has also been maintained at a high level during the past month despite what might be termed a pre-holiday period of inactivity at the close of the month. Of outstanding interest perhaps, was the announcement of the entrance of a new and important producer of acetone into that market. The new product is a synthetic one and although nothing official is really available for publication regarding the process used, the one which has received most credence in chemical circles is a conversion process involving propylene gas, isopropyl alcohol and acetone. With the announcement of this new production comes the interesting possibility that it comes just in time to avert a scarcity. Rapidly increasing consumption in the manufacture of cellulose acetate rayon and a development of a new market in the refining of lubricating oils are underlying reasons for this tremendous demand which might have occasioned some scarcity.

The dominant tone of the market generally during the past month has been continued, fine demand leading to some tightness of position on many items. Phenol continues to be in very short supply. The potential production seems quite sufficient to meet requirements, but producers appear to be unable to catch up with the demands occasioned by the entrance of so many new producers into the manufacture of synthetic resins. The wood chemical group are already being mentioned in terms of a scarcity, despite the fact that the heaviest producing season is barely over. As regards methanol, a tighter situation is undoubtedly close at hand. There is still some doubt however whether the scarcity of calcium acetate is a true shortage or merely the result of undue demands by buyers in anticipation of requirements because they fear a scarcity. Producers continue to work plants to capacity in an effort to keep up with schedules on formaldehyde, acetic acid, and oxalic acid, all of which are rather tight on spot.

The alkali group continues firm and excellent demand. Alcohol is moving normally and although there has been some talk of a raw material scarcity, most alcohol factors are advising that there is as yet no reason for undue alarm on this score. Insecticides and fungicides are moving in excellent volume as might be expected. Copper sulfate has continued its upward price climb following further advances in the metal. The mercury market is firm at higher prices, with foreign material dominating the market as domestic supplies have been sold up.



Business indicators prepared by the Department of Commerce. The weekly average 1923-1925 inclusive = 100. The solid line represents 1929 and the dotted line 1928.

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Mar. 1929 $1.017

Acetone — The past month has witnessed the entrance of a new producer into this market with volume production of synthetic acetone. Nothing official is known of the process used, but it is generally thought to be a conversion process involving propylene gas, isopropyl alcohol and finally acetone. The entrance of this new factor has occasioned no unsteadiness in prices and the market continues very firm. Although there is nothing resembling a scarcity, the position is fairly tight, so much so, that in some quarters it is thought that there might easily have been a real shortage had this new production not started at this time. This in spite of the fact that a large export market has been removed through the establishment of production in England which is expected to be in production by July 1. This present tightness in the situation is said to be chiefly due to the fast-growing outlet afforded through the increasing production of cellulose acetate rayon. In addition, an important new use is said to be developing rapidly in the refining of lubricating oils. This alone is a large potential market, but if acetone should be adopted by the oil industry generally for refining, there will be a new huge market for this material.

Acid Acetic — Continues very firm with plants working to capacity and deliveries moving forward as fast as the material is produced. Temporarily, production does not seem to have kept pace with consumption for import statistics show that during January imports of acetic acid were close to 3,000,000 pounds. None were recorded either in 1928 or 1927. Consumption in the manufacture of artificial silk has increased very rapidly and although there has been much new production, it has not increased quite so rapidly. There is already some talk of a scarcity of acetate of lime, but it is uncertain as to whether this is a real scarcity or just the effect of some buyers trying to anticipate requirements because they fear a shortage. Any such condition in the calcium acetate market is of course reflected almost immediately in that for acetic acid.

Acid Citric — Domestic producers maintain firm and steady prices and

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.26	.18½	.24	.24	Acetaldehyde, drs 1c-1 wks...lb.	.18½	.21	.21	.18½
				Acetaldol, 50 gal dr.....lb.	.27	.31	.31	.27
.24	.23	.20	.20	Acetanilid, tech, 150 lb bbl...lb.	.23	.24	.24	.23
.35	.29	.29	.29	Acetic Anhydride, 92-95%, 100 lb cbys.....lb.	.29	.35	.35	.29
.....	.....	.38	.32	Acetin, tech drums.....lb.	.30	.32	.32	.30
.15	.13	.....	.....	Acetone, CP, 700 lb drums c-1				
.15	.13	.12	.12	wks.....lb.	.....	.15	.15	.15
1.75	1.65	1.65	1.65	Acetone Oil, bbls NY.....gal.	1.15	1.25	1.25	1.15
.45	.42	.42	.42	Acetyl Chloride, 100 lb cby...lb.	.65	.45	.65	.65
				Acetylene Tetrachloride (see tetrachlorethane).....				
				Acids				
				Acid Acetic, 28% 400 lb bbls				
3.88	3.38	3.38	3.38	c-1 wks.....100 lb.	.....	3.88	3.88	3.88
13.68	11.92	11.92	11.92	Glacial, bbl c-1 wk....100 lb.	.....	13.68	13.68	13.68
1.00	.98	.98	.98	Anthranilic, refd, bbls.....lb.	.98	1.00	1.00	.98
.80	.80	.80	.80	Technical, bbls.....lb.	.....	.80	.80	.80
2.25	1.60	1.60	1.25	Battery, cbys.....100 lb.	1.60	2.25	2.25	1.60
.60	.57	.57	.57	Benzoic, tech, 100 lb bbls....lb.	.57	.60	.60	.57
.11	.08¼	.08¼	.08½	Boric, crys. powd, 250 lb bbls.....lb.	.05¾	.06¼	.06¼	.05¾
1.25	1.25	1.25	1.25	Broenner's, bbls.....lb.	.....	1.25	1.25	1.25
.90	.85	.85	.80	Butyric, 100% basis cbys.....lb.	.85	.90	.90	.85
4.85	4.85	4.90	4.85	Camphoric.....lb.	.....	4.85	4.85	4.85
.28	.13	.25	.25	Carbolic, 10%, 50 gal bbls....lb.	.13	.14	.14	.13
.16	.15	.15	.15	Chlorosulfonic, 1500 lb drums wks.....lb.	.04½	.05½	.05½	.04½
.30	.25	.37	.25	Chromic, 99%, drs extra.....lb.	.20	.23	.23	.20
1.06	1.00	1.00	1.00	Chromotropic, 300 lb bbls....lb.	1.00	1.06	1.06	1.00
.44½	.59	.44½	.43	Citric, USP, crystals, 230 lb. bbls.....lb.	.46	.59		.46
.97	.95	.95	.95	Cleve's, 250 lb bbls.....lb.	.52	.54	.59	.52
.70	.68	.60	.57	Cresylic, 95%, dark drs NY..gal.	.60	.70	.54	.60
.72	.72	.70	.60	97-99%, pale drs NY.....gal.	.72	.77	.70	.72
.12	.11	.11	.10	Formic, tech 85%, 140 lb. cby.....lb.	.11	.12	.77	.11
.55	.50	.50	.50	Gallic, tech, bbls.....lb.	.50	.55	.12	.50
.74	.74	.74	.69	USP, bbls.....lb.	.....	.74	.55	.74
1.06	1.00	1.00	1.00	Gamma, 225 lb bbls wks.....lb.	.97	.99	.74	.97
.63	.57	.57	.57	H, 225 lb bbls wks.....lb.	.68	.72	.99	.68
.67	.67	.67	.65	Hydriodic, USP, 10% soln cby lb.	.....	.67	.72	.67
.48	.45	.45	.45	Hydrobromic, 48%, coml, 155 lb cbys wks.....lb.	.45	.48	.67 .48	.45
				Hydrochloric, CP, see Acid Muriatic.....			.....	.....
.90	.80	.80	.80	Hydrocyanic, cylinders wks...lb.	.80	.90	.90	.80
.06	.06	.06	.06	Hydrofluoric, 30%, 400 lb bbls wks.....lb.	.....	.06	.06	.06
.11	.11	.11	.11	Hydrofluosilicic, 35%, 400 lb bbls wks.....lb.	.....	.11	.11	.11
.85	.85	.85	.85	Hypophosphorous, 30%, USP, demijohns.....lb.	.....	.85	.85	.85
.06	.04½	.05½	.05½	Lactic, 22%, dark, 500 lb bbls lb.	.04¼	.05	.05½	.04½
.13½	.12	.13	.13	44%, light, 500 lb bbls.....lb.	.11	.11½	.12½	.11
.54	.52	.52	.52	Laurent's, 250 lb bbls.....lb.	.40	.42	.42	.40
.60	.48	.....	.....	Malic, powd., kegs.....lb.	.48	.60	.60	.48
.65	.60	.60	.60	Metanilic, 250 lb bbls.....lb.	.60	.65	.65	.60
.08	.07½	.07½	.07¼	Mixed Sulfuric-Nitric..... tanks wks.....N unit	.07	.07½	.07½	.07
.01½	.01	.01	.01	tanks wks.....S unit	.008	.01	.01	.008
.21	.18	.21	.18	Monochloroacetic, tech bbl..lb.	.18	.21	.21	.18
.65	.65	1.65	1.65	Monosulfonic, bbls.....lb.	1.65	1.70	1.70	1.65
1.40	1.35	1.35	1.35	Muriatic, 18 deg, 120 lb cbys c-1 wks.....100 lb.	.....	1.35	1.40	1.35
				tanks, wks. 100 lb.		1.00	1.00	1.00
1.80	1.70	1.70	1.70	20 degrees, cbys wks...100 lb.	.....	1.45	.....	1.45
.95	.85	.95	.95	N & W, 250 lb bbls.....	.85	.95	.95	.85
.59	.55	.55	.55	Naphthionic, tech, 250 lb.....	.....	Nom.	.59	.55
5.00	5.00	5.00	5.00	Nitric, 36 deg, 135 lb cbys c-wks.....100 lb.	.....	5.00	5.00	5.00
6 00	6.00	6.00	6.00	40 deg, 135 lb cbys, c-1 wks.....100 lb.	.....	6.00	6.00	6.00
.11½	.10¾	.11¼	.11	Oxalic, 300 lb bbls wks NY...lb.	.11	.11½	.11½	.11
.08¼	.08	.08	.07	Phosphoric 50%, 150 lb cby..lb.	.08	.08¼	.08¼	.08
.16	.16	.19	.16	Syrupy, USP, 70 lb drs....lb.	.....	.16	.16	.16
.50	.50	.50	.50	Picramic, 300 lb bbls.....lb.	.65	.70	.70	.65
.50	.40	.45	.30	Picric, kegs.....lb.	.40	.50	.50	.40
.86	.86	.86	.86	Pyrogalic, technical, 200 lb bbls.....lb.	.....	.86	.86	.86
.32	.27	.27	.27	Salicylic, tech, 125 lb bbl.....lb.	.37	.42	.42	.37
.16	.15	.15	.15	Sulfanilic, 250 lb bbls.....lb.	.15	.16	.16	.15
1.95	1.60	1.60	1.60	Sulfuric, 66 deg, 180 lb cbys 1c-1 wks.....100 lb.	1.60	1.95	1.95	1.60
				tanks, wks. ton		15.50	15.50	15.50
1.37½	1.20	1.20	1.20	1500 lb dr wks.....100 lb.	1.50	1.65	1.65	1.50
1.12½	1.12½	1.10	1.10	60°, 1500 lb dr wks....100 lb.	1.27½	1.42½	1.42½	1.27½
1.52½	1.52½	1.50	1.50	Oleum, 20%, 1500 lb. drs 1c-1 wks ....100 lb.	.....	1.52½	1.52½	1.52½

A RESUMÉ

THE Carbide and Carbon Chemicals Corporation has for several years been producing a number of interesting synthetic organic chemicals. We are presenting below a short resumé of those now commercially available, together with a brief summary of their properties and uses.

ETHYLENE GLYCOL—a colorless, odorless, viscous liquid boiling at 197.2°C., with physical and chemical properties midway between those of alcohol and glycerine. Ethylene Glycol is used in the manufacture of dynamites and automobile anti-freeze solutions.

DIETHYLENE GLYCOL—a colorless, practically odorless liquid which boils at 244.5°C. and is even more viscous than ethylene glycol. It is extremely hygroscopic and is therefore used as a moistening and softening agent. It is used in the manufacture of composition cork and in the textile industry.

CELLOSOLVE* *(ethylene glycol mono ethyl ether)*—a lacquer solvent boiling at 134.8°C. characterized by a mild, pleasant odor and high dilution ratios for the coal tar hydrocarbons. Used in the formulation of odorless lacquers.

CELLOSOLVE ACETATE *(ethylene glycol mono ethyl ether acetate)*—a lacquer solvent boiling at 153°C. and possessed of a pleasant ester-like odor. It is remarkable for its high resistance to blushing and therefore finds its greatest use in automobile lacquers.

BUTYL CELLOSOLVE *(ethylene glycol mono butyl ether)*—a lacquer solvent boiling at 170.6°C., possessing a mild odor and a slow rate of evaporation which makes it ideal for use in brushing lacquers. It may also be incorporated in varnishes to reduce the viscosity without seriously diminishing the solid content.

METHYL CELLOSOLVE *(ethylene glycol mono methyl ether)*—the lowest boiling of the available Cellosolve derivatives (B. P. 124.5°C.) and especially interesting for its solvent action on cellulose acetate. It is used in the manufacture of cellulose acetate dopes and has some special advantages as a solvent for nitrocellulose.

CARBITOL* *(diethylene glycol mono ethyl ether)*—an excellent solvent for dyes, nitrocellulose and resins, boiling at 198°C. It is used in the manufacture of safety glass, in dye printing and textile soaps.

BUTYL CARBITOL *(diethylene glycol mono butyl ether)*—a solvent with a boiling point (222°C.) which approaches that of a plasticizer. It is used in baking lacquers, pyroxylin dopes and other plastics.

ETHYLENE DICHLORIDE—a colorless liquid with a pleasant odor and a boiling point of 83.5°C. It is very effective for the destruction of insect pests and is therefore used as a household and warehouse fumigant. As a solvent it is used in the extraction of fats and oils and in the manufacture of rubber cements.

DICHLOR ETHYL ETHER—a chlorinated solvent for fats and oils, particularly interesting because of its relatively high boiling point, 178°C. Used as a cleaning and spotting out agent in the formulation of textile soaps.

Detailed information about any of the above compounds can be secured by addressing our Technical Department.

CARBIDE AND CARBON CHEMICALS CORPORATION

Carbide and Carbon Building

30 East 42nd Street, New York City

UCC

Unit of Union Carbide and Carbon Corporation

*Trade-mark registered.

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Mar. 1929 $1.017

refuse to be effected by conditions abroad, especially in England where lack of raw material has occasioned a considerable shortage. That Britain too would like to be freed from this dependence upon foreign raw materials is evidenced by the following from the "Chemical Trade Journal and Chemical Engineer" which says that: "the time seems decidedly opportune for an investigation of the possibility of the revival of production of citric acid from Empire raw materials. The Sicilian interests in their endeavor, together with their German associates, to secure a monopoly of citric acid manufacture, have forced up the prices of citrate of lime to a point which makes it very difficult for purchasers to compete with them in the finished product—even if they can obtain supplies of the citrate in face of the further Italian policy of limitation. It has been known that British citric acid interests were desirous of coming to some understanding with the Italians, and that the proposals made by the latter were not considered satisfactory.

Acid Sulfuric — Continues in heavy demand with shipments moving rapidly into consuming channels. The market is very firm. Imports during January amounted to 1,087,259 pounds, as compared with 1,126,526 pounds in the preceeding year.

Acid Tartaric — Continues firm and unchanged. Reports from Italy indicate that the Italian syndicate has recently increased prices for cream of tartar and that further advances are indicated. There has been no change in the acid price there, but the market is very firm.

Albumen — Edible egg albumen has increased 2c lb. during the past month due to a very heavy demand, due apparently to the fact that buyers are trying to anticipate a higher duty. Quotations are at 78c @ 83c lb.

Alcohol — During the past month the movement has been routine, with good normal demand and prices well maintained. Raw material is firm but with no indication of any shortage as far as can be foreseen at present. There is reported to be no need for any anxiety on this score. Production of ethyl alcohol during February totaled 6,854,773 wine gallons, as compared with 7,560,835 gallons during January, and with 5,546,295 gallons in February, 1928, according to report by the Industrial Alcohol Institute. Compared with the previous month, production declined 9 per cent., although it increased 23½ per cent. over February last year, the decline from January, 1929, being due to the shorter working month. The combined alcohol inventories of all reporting members of the institute at the

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
42.00	42.00	42.00	42.00	40%, 1c-1 wks net ton	.....	42.00	42.00	42.00
.40	.30	.30	.30	Tannic, tech, 300 lb bbls lb.	.30	.40	.40	.30
.38	.34½	.37	.29½	Tartaric, USP, crys, powd, 300 lb. bbls lb.	.38	.38½	.38½	.38
.85	.85	.85	.85	Tobias, 250 lb bbls lb.	.....	.85	.85	.85
2.75	2.75	2.75	2.00	Trichloroacetic bottles lb.	.....	2.75	2.75	2.75
2.00	2.00	2.00	2.00	Kegs lb.	.....	2.00	2.00	2.00
1.25	1.00	1.00	1.00	Tungstic, bbls lb.	1.00	1.25	1.25	1.00
.55	.43	.45	.45	Albumen, blood, 225 lb bbls lb.	.43	.47	.47	.43
.84	.78	.95	.80	Egg, edible lb.	.78	.83	.83	.70
.80	.70	.92	.77	Technical, 200 lb cases lb.	.70	.75	.80	.70
.65	.60	.60	.60	Vegetable, edible lb.	.60	65	.65	.60
.55	.50	.50	.50	Technical lb.	.50	.55	.55	.50
				Alcohol				
.20	.18½	.20	.19	Alcohol Butyl, Normal, 50 gal drs c-1 wks lb.	.....	.1775	.17½	.17½
.19½	.18½	.20½	.19½	Drums, 1-c-1 wks lb.	.....	.1825	.18½	.18½
.19	.17½	.19½	.18½	Tank cars wks lb.	.....	.1725	.17½	.17½
2.25	1.75	.....	.....	Amyl (from pentane) drs c-1 wks gal.	.....	1.67	1.67	1.67
1.80	1.70	1.70	1.70	Diacetone, 50 gal drs del gal.	1.70	1.80	1.80	1.70
3.70	2.65	3.70	3.70	Ethyl, USP, 190 pf, 50 gal bbls gal.	.....	2.69½	2.69½	2.69½
.55	.50	.50	.50	Anhydrous, drums gal.	.....	.71	.71	.71
.52	.48½	.52	.37½	Completely denatured, No. 1, 190 pf, 50 gal drs drums extra gal.	.....	.49	.49	.49
.50	.43	.50	.29	No. 5, 188 pf, 50 gal drs. drums extra gal.	.....	.48	.48	.48
.46	.41	.46	.25	Tank, cars gal.	.....	.46	.46	.46
1.25	1.00	1.00	1.00	Isopropyl, ref, gal drs gal.	1.00	1.25	1.25	1.00
1.00	1.00	1.00	1.00	Propyl Normal, 50 gal dr. gal.	.....	1.00	1.00	1.00
.82	.80	.80	.80	Aldehyde Ammonia, 100 gal dr lb.	.80	.82	.82	.80
.65	.65	.65	.65	Alpha-Naphthol, crude, 300 lb bbls lb.	.....	.65	.65	.65
.37	.35	.35	.35	Alpha-Naphthylamine, 350 lb bbls lb.	.32	.34	.34	.32
3.30	3.25	3.25	3.15	Alum Ammonia, lump, 400 lb bbls, 1c-1 wks 100 lb.	3.25	3.30	3.30	3.25
5.50	5.25	5.25	5.25	Chrome, 500 lb casks, wks 100 lb.	5.25	5.50	5.50	5.25
3.20	3.10	3.50	3.10	Potash, lump, 400 lb casks wks 100 lb.	3.00	3.10	3.20	3.00
5.50	5.25	5.25	5.25	Chrome, 500 lb casks wks 100 lb.	5.25	5.50	5.50	5.25
3.75	3.75	3.75	3.75	Soda, ground, 400 lb bbls wks 100 lb.	.....	3.75	3.75	3.75
26.00	24.30	27.00	26.00	Aluminum Metal, c-1 NY 100 lb.	.....	24.30	24.30	24.30
.40	.35	.35	.35	Chloride Anhydrous, 275 lb drums lb.	.35	.40	.40	.35
.18	.17	.17	.17	Hydrate, 96%, light, 90 lb bbls lb.	.17	.18	.18	.17
.24	.18	.23	.23	Stearate, 100 lb bbls lb.	.25	.26	.26	.25
1.75	1.75	1.75	1.75	Sulfate, Iron, free, bags c-1 wks 100 lb.	1.95	2.05	2.05	1.95
1.40	1.40	1.40	1.35	Coml, bags c-1 wks 100 lb.	.....	1.40	1.40	1.40
1.15	1.15	1.15	1.15	Aminoazobenzene, 110 lb kegs lb.	.....	1.15	1.15	1.15
				Ammonium				
.14	.13½	.13½	.10	Ammonia, anhyd, 100 lb cyl. lb.	.14	.14	.14	.14
.03	.03	.03	.02½	Water, 26°, 800 lb dr del lb.	.....	.03½	.03½	.03½
.22	.21	.21	.21	Bicarbonate, bbls., spot 100 lb.	6.00	6.50	6.50	6.00
.09	.08¾	.08¾	.08¾	Bifluoride, 300 lb bbls lb.	.21	.22	.22	.21
5.15	4.45	5.05	4.85	Carbonate, tech, 500 lb cs. lb.	.09	.12	.12	.09
5.75	5.25	.07	.05½	Chloride, white, 100 lb. bbls wks 100 lb.	4.45	5.15	5.15	4.45
.11½	.11	.11	.11	Gray, 250 lb bbls wks lb.	5.25	5.75	5.75	5.25
.16	.15	.15	.15	Lump, 500 lb cks spot lb.	.11	.11½	.11½	.11
.10	.06	.06	.06	Lactate, 500 lb bbls lb.	.15	.16	.16	.15
.38	.27½	.27½	.27½	Nitrate, tech, casks lb.	.06	.10	.10	.06
.18	.18	.18	.18	Persulfate, 112 lb kegs lb.	.31	.34	.34	.31
2.90	2.20	2.30	2.55	Phosphate, tech, powd, 325 lb bbls lb.	.12½	.13	.13	.12½
3.00	2.50	2.55	2.35	Sulfate, bulk c-1 100 lb.	2.30	2.35	2.40	2.30
60.85	60.85	59.70	56.85	Southern points 100 lb.	.....	2.40	2.45	2.40
.60	.55	.55	.55	Nitrate, 26% nitrogen 31.6% ammonia imported bags ton	.....	60.85	60.85	60.85
2.25	1.72	2.25	1.90	Sulfocyanide, kegs lb.	.36	.48	.48	.36
.....	.....	.....	.....	Amyl Acetate, (from pentane) drs gal.	1.60	1.70	1.70	1.60
				Tech., drs gal.	1.60	1.70	1.70	1.60
				Alcohol, see Fusel Oil				
				Furoate, 1 lb tins lb.		5.00		
.16½	.15½	.15½	.15	Aniline Oil, 960 lb drs lb.	.15½	.16½	.16½	.15½
.48	.41	.41	.41	Annatto, fine lb.	.34	.37	.37	.34
1.00	.90	.90	.90	Anthraquinone, sublimed, 125 lb bbls lb.	.80	.90	.90	.80
.12	.09½	.11½	.14	Antimony, metal slabs, ton lots lb.	.....	.10	.10	.09½
.12	.10	.15½	.14	Needle, powd, 100 lb cs lb.	.....	.10	.10	.10
.18	.17	.17	.17	Chloride, soln (butter of) cbys lb.	.17	.18	.18	.17
.12	.09½	.16½	.16½	Oxide, 500 lb bbls lb.	.....	.10	.10	.09½
.....	.....	.28	.25½	Salt, 66%, tins lb.	.25½	.26	.26	.25½
.20	.16	.20	.16	Sulfuret, golden, bbls lb.	.16	.20	.20	.16
.42	.38	.42	.37½	Vermilion, bbls lb.	.38	.42	.42	.38
.19	.17	.18	.18	Archil, conc, 600 lb bbls lb.	.17	.19	.19	.17
.14	.12	.12	.12	Double, 600 lb bbls lb.	.12	.14	.14	.12
.16	.15	.16	.14	Triple, 600 lb bbls lb.	.15	.16	.16	.15
.08	.08	.15	.12½	Argols, 80%, casks lb.	.....	.08	.08	.08
.16	.15	.08	.03	Coude, 30%, casks lb.	.15	.16	.16	.15
.11	.10½	.10½	.10½	Arsenic, Red, 224 lb kegs, cs lb.	.09	.11	.11	.09
.04	.03½	.04	.03½	White, 112 lb kegs lb.	.04	.04½	.04½	.04
14.75	14.75	14.75	14.75	Asbestine, c-1 wks ton	.....	15.00	15.00	14.75

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end of February totaled 10,735,785 gallons, as against 9,721,324 gallons at the end of January, an increase of approximately 10 per cent. The total inventories however, are 13½ per cent. below those for the same time last year, when the figures were 12,449,764 gallons. Butyl alcohol is also reported to be in excellent demand with increasing quantities going into automobile production.

Ammonia — Business during the past month is reported to have been better than anticipated, with demand from refrigeration channels coming in strong and in large quantities. Both aqua and anhydrous are strong and in fine condition, with aqua in a shade better demand.

Ammonium Sulfate — The present outlook does not seem to augur very favorably for another season as good as that which was experienced last year. It is reported that the market is in rather easy position which is generally attributed to the fact that production is exceeding demands which in turn are not meeting the high level of last year. This has been reflected in current quotations which have declined 5c per 100 lbs. during the past month, so that quotations are at $2.30 @ $2.35 per 100 lbs., with Southern points at $2.40 per 100 lbs.

Antimony — Has been strong and in active demand during the past month. Buying has been proceeding in considerable volume and the Chinese market is strong due to further internal difficulties. Metal has advanced ½c lb. during the past month and is now at 10c lb. Oxide is also higher at 10c lb. while needle is unchanged.

Blood — The market has been easier and all prices are lower with material at New York and Chicago at $4.50 per unit, and South American at $4.60 per unit.

Borax — Continues unchanged with increasing uses in new fields. Chief interest during the month has centered about the report of the chairman of the board of Borax Consolidated, made at the annual meeting in London. During the course of his report he said in part as follows: "I reported to you at our last meeting that we were developing on one of our properties in Southern California a new borate mineral which would be more economical for the purpose of borax production than the minerals we had hitherto worked. We have during the year done a large amount of development work and have proved the existence of a very large body of this ore on our property. The use of it at our refineries in the United States and in Europe has enabled us to show a profit this year which we should probably not

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Barium			
57.00	47.00	47.50	47.50	Barium, Carbonate, 200 lb bags wks....ton	58.00	60.00	57.00
.12½	.12	.12	.12	Chlorate, 112 lb kegs NY..lb.	.14	.15	.14
65.00	54.00	65.00	57.50	Chloride, 800 lb bbl wks...ton	65.00	68.00	63.00
.13½	.13	.13	.13	Dioxide, 88%, 690 lb drs...lb.	.12	.13	.12
.04½	.04½	.04½	.04½	Hydrate, 500 lb bbls.....lb.	.04½	.05½	.04½
.08	.07½	.07½	.07½	Nitrate, 700 lb casks.....lb.	.08½	.08½	.08½
24.00	23.00	23.00	23.00	Barytes, Floated, 350 lb bbls wks.....ton	23.00	24.00	23.00
8.00	5.00	.....	.....	Bauxite, bulk, mines.....ton	5.00	8.00	5.00
.38	.36	.40	.37	Beeswax, Yellow, crude bags..lb.	.....	.36	.37	.36
.43	.41	.46	.38	Refined, cases.....lb.	.....	.41	.42	.41
.58	.56	.58	.56	White, cases.....lb.	.51	.53	.53	.51
.70	.65	.65	.65	Benzaldehyde, technical, 945 lb drums wks.....lb.	.60	.65	.65	.60
				Benzene			
.23	.21	.23	.21	Benzene, 90%, Industrial, 8000 gal tanks wks.....gal.	.....	.23	.23	.23
.23	.21	.23	.21	Ind. Pure, tanks works....gal.	.....	.23	.23	.23
.74	.70	.70	.70	Benzidine Base, dry, 250 lb bbls.....lb.	.70	.74	.74	.70
1.00	1.00	1.00	1.00	Benzoyl, Chloride, 500 lb drs.lb.	.....	1.00	1.00	1.00
.25	.25	.....	.....	Benzyl, Chloride, tech drs....lb.	.....	.25	.25	.25
.26	.24	.24	.24	Beta-Naphthol, 250 lb bbl wk.lb.	.24	.26	.26	.24
1.35	1.35	1.35	1.35	Naphthylamine, sublimed, 200 lb bbls.....lb.	.....	1.35	1.35	1.35
.65	.63	.63	.63	Tech, 200 lb bbls.....lb.	.65	.68	.68	.65
90.00	80.00	80.00	80.00	Blanc Fixe, 400 lb bbls wks..ton	80.00	90.00	90.00	80.00
				Bleaching Powder			
2.25	2.25	2.25	2.00	Bleaching Powder, 300 lb drs c-1 wks contract.....100 lb.	.....	2.25	2.25	2.25
2.00	2.00	2.25	2.00	700 lb drs c-1 wks contract .....100 lb.	.....	4.00	4.00	4.00
5.25	4.65	3.75	4.75	Blood, Dried, fob, NY.....Unit	.....	4.50	4.60	4.50
5.35	4.75	.....	.....	Chicago.....Unit	.....	4.50	4.85	4.50
5.05	4.50	.....	.....	S. American shipt.....Unit	.....	4.60	4.70	4.60
.35	.31	.30½	.28	Blues, Bronze Chinese Milori Prussian Soluble.....lb.	.32	.34	.34	.32
30.00	29.00	38.00	29.00	Bone, raw, Chicago.....ton	.....	42.00	42.00	42.00
.07	.06	.06½	.06	Bone, Ash, 100 lb kegs.....lb.	.06	.07	.07	.06
.08½	.08½	.08½	.08½	Black, 200 lb bbls.....lb.	.....	.08½	.08½	.08½
37.00	31.00	30.00	28.00	Meal, 3% & 50%, Imp....ton	.....	35.00	35.00	30.00
.05	.02½	.04½	.04½	Borax, bags.....lb.	.02½	.03½	.03½	.02½
.12	.10½	.11	.11	Bordeaux, Mixture, 16% pwd..lb.	.10½	.12	.12	.10½
.10	.08	.08	.08	Paste, bbls.....lb.	.10	.10½	.10½	.10
28.00	26.00	28.00	26.00	Brazilwood, sticks, shpmt....lb.	26.00	28.00	28.00	26.00
1.20	.60	.60	.60	Bronze, Aluminum, powd blk.lb.	.60	1.20	1.20	.60
1.25	.55	.55	.55	Gold bulk.....lb.	.55	1.25	1.25	.55
1.60	1.40	1.60	1.42	Butyl, Acetate, normal drs 1c-1 wks.....gal.	1.40	1.45	1.45	1.40
1.55	1.35	1.55	1.42	Tank, drs wks.....gal.	.....	1.35	1.35	1.35
1.05	1.00	1.00	1.00	Secondary, 50 gal drs.....gal.	1.00	1.05	1.05	1.00
.70	.70	.70	.70	Aldehyde, 50 gal drs wks...lb.	.....	.70	.70	.70
				Carbitol (see Diethylene Glycol Mono Butyl Ether).....	.....	.....	.....	.....
				Cellosolve (see Ethylene glycol mono butyl ether).....				
				Furoate, 1 lb tins.....lb.	.....	5.00		
.36	.34	.34	.34	Propionate, drs.....lb.	.34	.36	.36	.34
.60	.60	.60	.60	Stearate, 50 gal drs.....lb.	.....	.60	.60	.60
.60	.57	.57	.57	Tartrate, drs.....lb.	.57	.60	.60	.57
2.00	1.35	1.50	1.35	Cadmium, Sulfide, boxes.....lb.	.95	1.75	1.75	.75
				Calcium			
4.50	3.50	3.50	3.50	Calcium, Acetate, 150 lb bags c-1.....100 lb.	.....	4.50	4.50	4.50
.09	.06	.07½	.07½	Arsenate, 100 lb bbls c-1 wks.....lb.	.07	.09	.09	.07
.06	.05	.05	.05	Carbide, drs.....lb.	.05	.06	.06	.05
1.00	1.00	1.00	1.00	Carbonate, tech, 100 lb bags c-1.....lb.	1.00	1.00	1.00	1.00
27.00	25.00	27.00	27.00	Chloride, Flake, 375 lb drs c-1 wks.....ton	.....	25.00	25.00	25.00
23.00	20.00	21.00	21.00	Solid, 650 lb drs c-1 fob wks .....ton	20.00	20.00	20.00	20.00
52.00	52.00	52.00	52.00	Nitrate, 220 lb bbls c-1 NY.ton	.....	52.00	52.00	52.00
.....	.....	.....	.....	Peroxide, 100 lb. drs.....lb.	.....	1.25	1.25	1.25
.08	.07	.09	.09	Phosphate, tech, 450 lb bbls lb.	.08	.08½	.08	.07
				Stearate, 100 lb bbls.....lb.	.25	.26		
.18	.18	.....	.....	Camwood, Bark, ground bbls..lb.	.....	.18	.18	.18
.28	.22	.33	.33	Candelilla Wax, bags.....lb.	.....	.22	.22	.22
				Carbitol, (See Diethylene Gycol Mono Methyl Ether).....	.....	.....	.....	.....
.15	.08	.08	.08	Carbon, Decolorizing, 40 lb bags c-1.....lb.	.08	.15	.15	.08
.12	.12	.12	.12	Black, 100-300 lb cases 1c-1 NY.....lb.	.....	.12	.12	.12
.06	.05½	.05½	.05½	Bisulfide, 500 lb drs 1c-1 NY.....lb.	.05½	.06	.06	.05½
.06	.06	.06	.06	Dioxide, Liq. 20-25 lb cyl...lb.	.....	.06	.06	.06
.07½	.07	.07	.07	Tetrachloride, 1400 lb drs delivered.....lb.	.06½	.07½	.07½	.06½
.58	.45	.50	.50	Carnauba Wax, Flor, bags....lb.	.42	.43	.43	.42
.60	.40	.90	.54	No. 1 Yellow, bags.....lb.	.37	.38	.40	.37
.38	.34	.37	.24	No. 2 N Country, bags.....lb.	.29	.30	.32	.29
.56	.38	.68	.48	No. 2 Regular, bags.....lb.	.33	.34	.36	.33
.32	.25	.....	.....	No. 3 N. C.....lb.	.....	.25	.25	.25
.32	.25½	.....	.....	No. 3 Chalky.....lb.	.....	.25½	.26	.25
.18½	.14½	.18½	.15½	Casein, Standard, ground.....lb.	.15½	.16	.16	.15½

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otherwise have made in face of the competition which we have had to meet from various sources in the United States of America The competition does not arise from one source alone, but from several, operating in different ways. The largest and most important is that of an American company operating in California, producing potash from lake brines and also borax in the proportion of about one ton of borax to two tons of potash. The borax being produced as part of the operations has to be forced onto the market. This, with the competition from other United States of America sources, has led to a disastrous reduction in the price of both borax and of boric acid, the market being flooded with more than it can at present absorb. So far as potash is concerned, the European producers have, so far not met this potash competition by a reduction in price, as the production of potash at present in the United States supplies only about 20 per cent. of the consumption there. It appears probable that a large increase of potash production in the United States may take place in the near future.

We have a large patented or freehold property on Searles Lake and have the right to work the brine free of royalty for the production of potash and by-products. During the war we did a large amount of experimental work for the production of potash, but at that time processes were not sufficiently developed to enable this to be done at a profit, especially as we then did not aim at producing any by-products. So far as our new mineral is concerned, this is the most economical ore we have yet developed for the manufacture of borax, but it has also great possibilities in other directions for use in various industries, especially in a concentrated form. There have been some difficulties in treating it, but these have been overcome.

Butyl Acetate — Conditions are now more nearly normal than they have been, although sales have been made during the past month at 2c gal. below quoted prices. But the situation is generally improved and firmer.

Calcium Acetate — Already there are reports from some quarters regarding some tightness in the present market situation on this material. Whether or not this portends any real scarcity or merely is the result of overcautiousness on the part of some buyers who are attempting to stock up in anticipation of a scarcity, remains to be seen. It seems quite possible that the latter explanation may be the true one. Some imports have been brought in recently and they have had a tendency to ease the situation.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Cellosolve (see Ethylene glycol mono ethyl ether)			
				Acetate (see Ethylene glycol mono ethyl ether acetate)			
.30	.26	.34	.26	Celluloid, Scraps, Ivory cs....lb.	.26	.30	.26
.20	.18	.18	.18	Shell, cases....lb.	.18	.20	.20 .18
.32	.30	.34	.26	Transparent, cases....lb.	.30	.32	.32 .30
1.40	1.40	1.40	1.40	Cellulose, Acetate, 50 lb kegs .lb.	1.20	1.25	1.25 1.20
.03¾	.03	.03	.03	Chalk, dropped, 175 lb bbls...lb.	.03	.03¼	.03¼ .03
.04½	.04½	.02½	.02½	Precip, heavy, 560 lb cks...lb.	.02	.03½	.03½ .02
.03½	.02½	.04½	.04½	Light, 250 lb casks....lb.	.02¼	.03½	.03½ .02¼
.19	.18	.18	.18	Charcoal, Hardwood, lump, bulk wks....bu.	.18	.19	.19 .18
.06¼	.06	.06	.06	Willow, powd, 100 lb bbl wks....lb.	.06	.06¼	.06¼ .06
.05	.04	.04	.04	Wood, powd, 100 lb bbls...lb.	.04	.05	.05 .04
.03	.02	.03	.02½	Chestnut, clarified bbls wks,..lb.	.02½	.03	.02 .03½
.02	.01½	.02	.01½	25% tks wks....lb.	.01½	.02	.02 .01½
.04 4/5	.04 4/5	.05½	.05½	Powd, 60%, 100 lb bgs wks.lb.	.....	.04 4/5	.04 4/5 .04 4/5
.06	.05½	.06½	.06½	Powd, decolorized bgs wks..lb.	.05½	.06	.06 .05½
9.00	8.00	8.00	8.00	China Clay, lump, blk mines.ton	8.00	9.00	9.00 8.00
.02	.01¾	.01¾	.01¾	Powdered, bbls....lb.	.01¾	.02	.02 .01¾
12.00	10.00	10.00	10.00	Pulverized, bbls wks....ton	10.00	12.00	12.00 10.00
25.00	15.00	15.00	15.00	Imported, lump, bulk....ton	15.00	25.00	25.00 15.00
.03½	.03	.03	.03	Powdered, bbls....lb.	.03	.03½	.03½ .03
				Chlorine			
.09	.08	.08	.08	Chlorine, cyls 1c-1 wks contract ....lb.	.07½	.08½	.08½ .07½
.....	.....	.....	.....	cyls, cl wks,. contract ...lb.	.....	.04½	.04½ .04½
.03½	.03½	.05½	.04	Liq tank or multi-car lot cyls wks contract....lb.	.....	.03	.03 .03
.07	.07	.07	.07	Chlorobenzene, Mono, 100 lb. drs 1c-1 wks....lb.	.08½	.09½	.09½ .08½
.22	.20	.20	.20	Chloroform, tech, 1000 lb drs..lb.	.18	.20	.20 .18
1.35	1.00	1.00	1.00	Chloropicrin, comml cyls....lb.	1.00	1.35	1.35 1.00
.29	.26	.27	.26	Chrome, Green, CP....lb.	.26	.29	.29 .26
.11	.06½	.06½	.06½	Commercial....lb.	.06½	.11	.11 .06½
.17	.15¼	.17½	.16½	Yellow....lb.	.17	.18	.18 .15
.05¾	.04¾	.05	.04½	Chromium, Acetate, 8% Chrome bbls....lb.	.04¾	.05¾	.05¾ .04¾
.05½	.05½	.05½	.05½	20° soln, 400 lb bbls....lb.	.....	.05½	.05½ .05½
.28	.27	.27	.27	Fluoride, powd, 400 lb bbl..lb.	.27	.28	.28 .27
.35½	.34½	.34½	.34½	Oxide, green, bbls....lb.	.34½	.35½	.35½ .34½
9.50	9.00	9.50	9.00	Coal tar, bbls....bbl	10.00	10.50	10.50 10.00
2.22	2.10	2.10	2.10	Cobalt Oxide, black, bags....lb.	2.10	2.22	2.22 2.10
.87	.84	.92	.77	Cochineal, gray or black bag..lb.	.....	.95	.95 .95
.86	.86	.92	.77	Teneriffe silver, bags....lb.	.....	.95	.95 .95
				Copper			
17.00	12.90	13.57½	12.90	Copper, metal, electrol...100 lb.	.....	24.00	24.00 17.00
.17¼	.16	.16¾	.06¼	Carbonate, 400 lb bbls....lb.	.19	.25	.25 .18
.28	.28	.28	.28	Chloride, 250 lb bbls....lb.	.25	.28	.28 .25
.50	.48	.48	.48	Cyanide, 100 lb drs....lb.	.55	.60	.60 .48
.17	.16½	.16½	.16½	Oxide, red, 100 lb bbls....lb.	.....	.18	.18 .16½
.19	.18	.18	.17	Sub-acetate verdigris, 400 lb bbls....lb.	.18	.19	.19 .18
5.50	5.05	5.00	4.75	Sulfate, bbls c-1 wks...100 lb.	.....	7.00	7.00 5.65
14.00	13.00	17.00	13.00	Copperas, crys and sugar bulk c-1 wks....ton	13.00	14.00	14.00 13.00
1.35	1.25	1.25	1.25	Sugar, 100 lb bbls....100 lb.	1.25	1.35	1.35 1.25
.42	.40	.40	.40	Cotton, Soluble, wet, 100 lb bbls....lb.	.40	.42	.42 .40
.....	.....	42.00	20.00	Cottonseed, S. E. bulk c-1...ton	.....	.....	....
.....	.....	42.00	20.00	Meal S. E. bulk....ton	.....	.....	....
38.00	36.00	35.00	21.50	7% Amm., bags mills...ton	37.50	38.00	38.00 37.50
.27½	.26	.27	.22	Cream Tartar, USP, 300 lb. bbls....lb.	.27¾	.28	.28 .27½
.42	.40	.40	.40	Creosote, USP, 42 lb cbys....lb.	.40	.42	.42 .40
.19	.17	.20	.20	Oil, Natural, 50 gal drs....gal.	.17	.19	.19 .17
.23	.21	.25	.25	10-15% tar acid....gal.	.21	.23	.23 .21
.28	.25	.....	.....	25-30% tar acid....gal.	.25	.28	.28 .25
.20	.17½	.17½	.17½	Cresol, USP, drums....lb.	.14	.17	.17 .14
.17	.16	.17	.16	Crotonaldehyde, 50 gal dr....lb.	.32	.36	
.18½	.18½	.18½	.15	Cudbear, English....lb.	.16	.17	.17 .16
.07	.06	.05	.05½	Cutch, Rangoon, 100 lb bales..lb.	.14	.16	.16 .14
1.75	1.67½	1.82½	1.67½	Borneo, Solid, 100 lb bale..lb.	.08	08½	.08½ .08
5.12	3.77	3.92	3.77	Cyanamide, bulk c-1 wks Amm. ....lb.	.....	1.70	1.70 1.70
5.07	3.72	3.87	3.72	Dextrin, corn, 140 lb bags.100 lb.	4.62	4.82	4.82 4.62
.09	.08	.08½	.08½	White, 130 lb bags....100 lb.	4.57	4.77	4.77 4.57
.09	.08	.08½	.08½	Potato, Yellow, 220 lb bgs..lb.	.08	.09	.09 .08
.08½	.08	.08½	.08	White, 220 lb bags 1c-1....lb.	.08	.09	.09 .08
.....	.....	3.80	3.80	Tapioca, 200 lb bags 1c-1...lb.	.08	.08½	.08½ .08
3.80	3.80	2.95	2.85	Diaminophenol, 100 lb kegs..lb.	.....	3.80	3.80 3.80
2.90	2.85	3.25	3.25	Diamylphthalate, drs wks...gal.	.....	3.80	3.80 3.80
.28	.26½	.31½	.29½	Dianisidine, 100 lb kegs....lb.	3.00	3.10	3.10 3.00
.31½	.29½	.55	.55	Dibutylphthalate, wks....lb.	.....	.26½	.26½ .26½
.....	.....	.....	.....	Dibutyltartrate, 50 gal drs...lb.	.29½	.31½	.31½ .29½
.65	.55	.23	.23	Dichloroethylether, 50 gal drs lb.	.05	.07	.13 .05
.25	.23	2.15	2.15	Dichloromethane, drs wks....lb.	.55	.65	.65 .55
2.15	2.15	1.85	1.85	Diethylamine, 400 lb drs....lb.	.23	.25	.25 .23
2.00	1.85	.55	.55	Diethylcarbonate, drs .....gal.	1.85	1.90	1.90 1.85
.60	.55.	20	.20	Diethylaniline, 850 lb drs....lb.	.55	.60	.60 .55
.15	.10	.....	.....	Diethyleneglycol, drs....lb.	.10	.12	.13 .10
.35	.25	.....	.....	Mono ethyl ether, drs....lb.	.13	.15	.15 .13
.....	.....	.....	.....	Mono butyl ether, drs....lb.	.28	.30	.30 .25
.....	.....	.....	.....	Mono methyl ether, 50 gal. dr....lb.	.17	.20	.15 .13 .22 .17
.67	.64	.64	.64	Diethylene oxide, 50 gal dr....lb.	.....	.50	.50 .50
.26	.24	.25	.25	Diethylorthotoluidin, drs....lb.	.64	.67	.67 .64
.35	.30	.30	.30	Diethyl phthalate, 1000 lb drums....lb.	.24	.26	.26 .24
2.62	2.62	2.60	2.60	Diethylsulfate, technical, 50 gal drums....lb.	.30	.35	.35 .30
.32	.30	.32	.30	Dimethylamine, 400 lb drs...lb.	.....	2.62	2.62 2.62
				Dimethylaniline, 340 lb drs...lb.	.30	.32	.32 .30

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There will also be the usual seasonal closing of the wood distillation plants as the summer season advances. Establishments engaged in wood distillation in 1927 reported products valued at $27,630,487, an increase of 9.3 per cent. as compared with $25,283,432 reported for 1925, the last preceding census year.

The quantities and values of the chief products manufactured for sale in 1927 are as follows: Methanol (wood alcohol), refined, 5,001,832 gallons, valued at $2,951,793; methanol, crude, 5,732,699 gallons, valued at $2,072,101; acetate of lime, 69,016 tons, valued at $4,020,669; charcoal, 42,277,206 bushels, valued at $6,268,345.

Casein — But little activity has been evidenced during the past month. This is probably a reaction from the heavy buying which has featured the past few months. Consumers are all well supplied with their needs well anticipated as a result of the tariff activities which occasioned much heavy buying at that time. Prices remain unchanged at 15½c @ 16c lb. United States production as well as imports of casein have more than doubled within the last decade, according to the Department of Commerce. Over 18,000,000 pounds were produced in the United States in 1927, as compared with 11,000,000 in 1918. Imports during 1927 amounted to more than 24,000,000 pounds and increased to 27,000,000 in 1928, in comparison with 12,000,000 pounds in the 1918 fiscal year. To-day, casein is the fourth largest chemical raw material imported into the United States. Production of casein in the United States decreased from 14,000,000 pounds in 1919 to 7,000,000 in 1922, and the proportion of total consumption supplied by domestic producers declined. The domestic output subsequently increased, reaching the highest point, 20,759,000 pounds, in 1924. Production in 1927 amounted to 18,033,000 pounds. Imports of casein entered for consumption in 1928, according to preliminary figures, amounted to 27,450 000 pounds, valued at $3,600,000, registering an increase of 10 per cent. in quantity and 16 per cent. in value over 1927 receipts of 24,260,000 pounds, invoiced at slightly over $3,117,000. Exports of casein from Argentina to the United States in 1928 amounted to 23,275,110 pounds, valued at $2,895,800. This represented an 11 per cent. increase in quantity and a 15 per cent. increase in value over 1927, when 19,589,813 pounds, value $2,460,564, were imported from Argentine.

Chlorine — Continues in very firm condition with no excess material available as demand has been taking care of this material as fast as it has been pro-

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.50	.45	.45	.45	Dimethylsulfate, 100 lb drs...lb.	.45	.50	.50	.45
.16½	.15½	.15½	.15	Dinitrobenzene, 400 lb bbls...lb.	.15½	.16½	.16½	.15½
.19	.18	.18	.18	Dinitrochlorine, 300 lb bbl....lb.	.18	.19	.19	.18
.16	.15	.15	.15	Dintrochlorobenzene, 400 lb bbls.....lb.	.13	.15	.15	.13
.34	.32	.32	.32	Dinitronaphthalene, 350 lb bbls .....lb.	.34	.37	.37	.34
.32	.31	.31	.31	Dinitrophenol, 350 lb bbls....lb.	.31	.32	.32	.31
.19	.18	.18	.15	Dinitrotoluene, 300 lb bbls...lb.	18	.19	.19	.18
.90	.48	1.05	.85	Diorthotolyguanidine, 275 lb bbls wks.....lb.	.42	.46	.49	.42
.....	.....	.....	.....	Dioxan (See Diethylene Oxide)	.....	.....	.....	.....
.47	.45	.18	.45	Diphenylamine.....lb.	.43	.47	.47	.43
.72	.40	.....	.....	Diphenylguanidine, 100 lb bbl lb.	.30	.35	.40	.30
.30	.26	.26	.26	Dip Oil, 25%, drums.....lb.	.26	.30	.30	.26
62.00	58.00	49.00	41.00	Divi Divi pods, bgs shipmt..ton	.....	55.00	57.00	55.00
.05½	.05	.04	.04	Extract.....lb.	.05	.05½	.05½	.05
.82	.73	.84	.72	Egg Yolk, 200 lb cases.....lb.	.80	.82	.82	.77
1.75	1.7	2.00	1.75	Epsom Salt, tech, 300 lb bbls c-1 NY.....100 lb.	1.70	1.75	1.75	1.75
.38	.37	.45	.37	Ether, USP, 1880, 50 lb drs..lb.	.38	.39	.39	.38
1.05	.75	.90	.90	Ethyl Acetate, 85% Ester, 110 gal drs.....gal.	.95	.98	1.05	.95
1.25	1.10	1.10	1.03	99% gal drums.....gal.	1.15	1.18	1.25	1.15
.....	.....	.....	.....	Acetoacetate, 50 gal drs...gal.	.65	.68	.68	.65
1.11	1.05	1.05	1.05	Benzylaniline, 300 lb drs...lb.	1.05	1.11	1.11	1.05
.70	.70	.50	.50	Bromide, tech, drums .....lb.	.50	.55	.55	.50
.....	.....	.....	.....	Carbonate, 90%, 50 gal drs gal.	1.85	1.90	1.90	1.85
.22	.22	.22	.22	Chloride, 200 lb. drums....lb.	.....	.22	.22	.22
.....	.....	.....	.....	Chlorocarbonate, 50 gal dr .gal.	.35	.40	.40	.35
.....	.....	.....	.....	Ether, Absolute, 50 gal drs..lb.	.50	.52	.52	.50
				Furoate, 1 lb tins .....lb.	.....	5.00	5.00	5.00
3.50	3.50	3.50	3.50	Lactate, drums works.....lb.	.25	.29	.35	.25
.30	.30	.30	.30	Methyl Ketone, 50 gal drs..lb.	.....	.30	.30	.30
.55	.45	.45	.45	Oxalate, drums works.....lb.	.45	.55	.55	.45
.36	.30	.....	.....	Oxybutyrate, 50 gal drs wks.lb.	.....	.30½	.36	.30
.70	.70	.70	.70	Ethylene Bromide, 60 lb dr...lb.	.....	.70	.70	.79
.85	.75	.75	.75	Chlorhydrin, 40%, 50 gal drs chloro. cont.....lb.	.75	.85	.85	.75
.11	.07	.15	.11	Dichloride, 50 gal drums...lb.	.05	.07	.10	.05
.40	.25	.30	.30	Glycol, 50 gal drs wks.....lb.	.25	.28	.30	.25
.27	.31	.....	.....	Mono Butyl Ether drs wks.	.23	.27	.31	.23
.20	.24	.....	.....	Mono Ethyl Ether drs wks	.16	.20	.24	.16
.23	.26	.....	.....	Mono Ethyl Ether Acetate dr. wks.....	.19	.23	.26	.19
				Mono Methyl Ether, drs.lb.	.19	.23	.23	.19
				Oxide, cyl.....lb.	.....	2.00		
.65	.62	.62	.62	Ethylidenaniline.....lb.	.62	.65	.65	.62
25.00	20.00	20.00	20.00	Feldspar, bulk.....ton	40.00	25.00	25.00	20.00
21.00	15.00	15.00	15.00	Powdered, bulk works.....ton	15.00	.21	21.00	15.00
.09	.07½	.07½	.07½	Ferric Chloride, tech, crystal 475 lb bbls.....lb.	.07½	.09	.09	.07½
5.50&10	4.90&10	5.60	4.15	Fish Scrap, dried, wks.....unit	.....	Nom.	Nom.	Nom.
4.75&50	4.00&50	3.50	4.24	Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis...unit	.....	Nom.	Nom.	Nom.
1.15	1.10	1.10	.90	Flavine, lemon, 55 lb cases...lb.	1.10	1.15	1.15	1.10
1.15	1.10	1.10	.85	Orange, 70 lb cases.....lb.	1.10	1.15	1.15	1.10
				Flaxseed.....lb.	.....	.....		
.....	.....	.....	.....	Ex-dock.....ton	.....	25.00	25.00	25.00
25.00	25.00	25.00	25.00	Fluorspar, 98%, bags.....	41.00	46.00	46.00	41.00
				Formaldehyde				
.....	.....	.....	.....	Formaldehyde, aniline, 100 lb.	.....	.....	.....	.....
.42	.39	.39	.39	drums.....lb.	.39	.42	.42	.39
.09	.08½	.11½	.08½	USP, 400 lb bbls lc-1 wks..lb.	.09½	.10	.10	.09½
.04	.02½	.02½	.02½	Fossil Flour.....lb.	.02½	.04	.04	.02½
20.00	15.00	15.00	15.00	Fullers Earth, bulk, mines..ton	15.00	20.00	20.00	15.00
30.00	25.00	25.00	25.00	Imp. powd c-1 bags.....ton	25.00	30.00	30.00	25.00
				Furan, 1 lb tins.....lb.	.....	20.00	20.00	20.00
.19½	.1	.17½	.17½	Furfural 500 lb drums.....lb.	.17½	.19½	.19½	.17½
.....	.....	.....	.....	Furfuramide (tech) 100 lb dr..lb.	.....	.30	.30	.30
.....	.....	.....	.....	Furfuryl Acetate, 1 lb tins....lb.	.....	5.00	5.00	5.00
.....	.....	.....	.....	Alcohol, 100 lb dr.....lb.	.....	.50	.50	.50
.....	.....	.....	.....	Furoic Acid (tech) 100 lb dr...lb.	.....	1.00	1.00	1.00
1.35	1.35	1.69	1.35	Fusel Oil, 10% impurities ...gal.	.....	1.35	1.35	1.35
.05	.04	.04	.04	Fustic, chips.....lb.	.04	.05	.05	.04
.22	.20	.20	.20	Crystals, 100 lb boxes.....lb.	.20	.22	.22	.20
.10	.09	.09	.09	Liquid, 50°, 600 lb bbls....lb.	.09	10	.10	.09
.23	.20	.20	.20	Solid, 50 lb boxes.....lb.	.14	.16	.16	.14
32.00	30.00	30.00	30.00	Sticks.....ton	25.00	26.00	26.00	25.00
.52	.50	.50	.50	G Salt paste, 360 lb bbls.....lb.	.50	.52	.52	.50
21	.20	.20	.20	Gall Extract.....lb.	.20	.21	.21	.20
.09	.08	.08	.06	Gambier, common 200 lb cs...lb.	.06	.07	.07	.06
.14	.12	.12	.12	25% liquid, 450 lb bbls....lb.	.12	.14	.14	.12
.12	.11	.23	.11	Singapore cubes, 150 lb bg..lb.	.08½	.09	.09	.08½
.50	.45	.45	.30	Gelatin, tech, 100 lb cases....lb.	.45	.50	.50	.45
3.24	3.14	3.14	3.14	Bags, c-1 NY.....100 lb.	3.14	3.24	3.24	3.14
1.00	.70	1.05	1.05	Glauber's Salt, tech, 250 lb bags c-1 wks.....100 lb.	.70	1.00	1.00	.70
3.34	3.24	3.24	3.24	Glucose (grape sugar) dry 70-80° bags c-1 NY.....100 lb.	3.24	3.34	3.34	3.20
3.14	3.14	3.14	3.14	Tanner's Special, 100 lb bags .....100 lb.	.....	3.14	3.14	3.14
.24	.20	.20	.20	Glue, medium white, bbls ...lb.	.20	.24	.24	.20
.26	.22	.22	.22	Pure white, bbls.....lb.	.22	.26	.26	.22
.19	.15	.29	.22	Glycerin, CP, 550 lb drs.....lb.	.15½	.16	.16	.15½
.15	.11½	.25	.17	Dynamite, 100 lb drs.....lb.	.12	.12½	.12½	.12
.10½	.08½	.....	.....	Saponification, tanks.....lb.	.08½	.08½	.08½	.08½
.09½	.07½	.....	.....	Soap Lye, tanks.....lb.	.....	.07½	.07½	.07½
35.00	15.00	15.00	15.00	Graphite, crude, 220 lb bgs...ton	15.00	35.00	35.00	15.00
.09	.06	.05	.05	Flake, 500 lb bbls.....lb.	.06	.09	.09	.06
				Gums				
.04½	.03½	.03½	.03½	Gum Accroides, Red, coarse and fine 140-150 lb bags.....lb.	.03½	.04½	.04½	.03½
.06½	.06	.06	.06	Powd, 150 lb bags.....lb.	.06	.06½	.06½	.06

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duced. This has been in spite of the fact that the entire paper industry has been going through a period of uncertainty which has caused them to reduce operating schedules until the internal difficulties had been settled. Conditions have finally become normal again and this should make itself felt in increasing demand for chlorine.

Chrome Yellow — Constant advances in the price of pig lead have been reflected by advances in this material which is now quoted at 17c @ 18c lb. Further advances seem quite likely.

Copper — The close of last month brought a period of respite to the copper market due chiefly to the extended holidays abroad. This ended temporarily the steady upward climb of copper prices which had reached $24.00 per 100 lbs. Some quarters expect that the advance has not yet ended and predict copper at 25c lb. This is quite possible unless buyers cease their demands. There is plenty of copper but the refineries can only turn out so much at a time. Accompanying the rise in the price of copper, but not moving quite so fast in proportion, the price of the sulfate has gone higher until quoted at $7.00 per 100 lbs.

Egg Yolk — Has become very scarce and is likely to continue so until after the middle of June when new crop becomes available. In line with the shortage, prices have been advanced during the past month to 80c @ 82c lb.

Ethyl Acetate — Demand has slackened temporarily although the market is in better condition than it has been. Prices have also been reduced to the basis of 95c gal. on the 85 per cent., and will continue that way until July 1.

Ethyl Lactate — Has been reduced in price and is now quoted at 25c @ 29c lb. Oxybutyrate is now at 30½c lb.

Gums — Sandarac has staged a further advance during the past month and is now quoted at 67c @ 68c lb. Production of kauri gum in New Zealand has declined considerably since 1925 when returns of gum arrivals reaching Auckland Stores amounted to 5,068 metric tons, according to the Department of Commerce. Receipts for the succeeding years were, respectively, 4,250, 3,820, and 4,000 metric tons. Although last year showed a gain in quantity of gum receipts at Auckland over the previous year, little demand prevailed throughout the year for the better qualities of gum. The result was that only small shipments of high grades reached the market. December exports of kauri gum totaled 431,475 pounds as against 378,363 pounds in December, 1927. The United States is the largest buyer of Singapore gum copal, nearly two-thirds of

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.20	.18	.18	.18	Yellow, 150-200 lb bags....lb.	.18	.20	.20	.18
				Animi (Zanzibar) bean & pea				
.40	.35	.40	.35	250 lb cases.....lb.	.35	.40	.40	.35
.55	.50	.60	.50	Glassy, 250 lb cases.....lb.	.50	.55	.55	.50
				Asphaltum, Barbadoes (Manjak)				
.12	.09	.09	.09	200 lb bags.....lb.	.09	.12	.12	.09
.17	.15	.15	.15	Egyptian, 200 lb cases.....lb.	.15	.17	.17	.15
				Gilsonite Selects, 200 lb bags				
65.00	55.00	55.00	55.00	.....ton	58.00	65.00	65.00	58.00
				Damar Batavia standard 136, lb				
.26	.22½	.26½	.26½	cases.....lb.	.23	.24	.26	.23
.11	.10½	.10½	.07	Batavia Dust, 160 lb bags.....lb.	.10½	.11	.11	.10½
.17½	.16	.18½	.17½	E Seeds, 136 lb cases.....lb.	.17	.17½	.17½	.17
				F Splinters, 136 lb cases and				
.14½	.13	.14	.09	bags.....lb.	.13	.13½	.13½	.13
.30½	.29½	.34	.33½	Singapore, No 1, 224 lb cases lb.	.29	.30	.30½	.29
.24	.20	.22½	.21	No. 2, 224 lb cases.....lb.	.23	.23½	.24	.23
.15	.13½	.14	.11	No. 3, 180 lb bags.....lb.	.13½	.14	.14	.13½
				Benzoin Sumatra, U. S. P. 120 lb				
.48	.33	.35	.30	cases.....lb.	.38	.40	.40	.38
				Copal Congo, 112 lb bags, clean				
.15	.14	.14	.12	opaque.....lb.	.14	.15	.15	.14
.09	.08½	.08½	.08½	Dark, amber.....lb.	.08½	.09	.09	.08½
.14	.12½	.12½	.12½	Light, amber.....lb.	.12½	.14	.14	.12½
.36	.35	.35	.35	Water white.....lb.	.35	.36	.36	.35
.65	.58	.....	.....	Mastic.....lb.	.60	.62	.62	.60
				Manila, 180-190 lb baskets				
.17½	.16	.16	.16	Loba A.....lb.	.17	.17½	.17½	.17
.16½	.15	.15	.15	Loba B.....lb.	.16	.16½	.16½	.16
.14	.13	.14½	.13	Loba C.....lb.	.14	.14½	.14½	.14
.19	.16	.16	.16	Pale bold, 224 lb cs.....lb.	.17	.19	.19	.17
.13½	.12	.14	.12	Pale nubs.....lb.	.13	.13½	.13½	.13
.11	.07½	.07½	.07½	East Indies chips, 180 lb bags lb.	.10	.11	.11	.10
.21	.17	.....	.....	Pale bold, 180 lb bags....lb.	.20	.21	.21	.20
.16	.14	.17	.17	Pale nubs.....lb.	.15	.16	.16	.15
.....	.....	.....	.....	Pontianak, 224 lb cases....lb.	.....	.....		
.25½	.22	.29	.25	Pale bold gen No 1.....lb.	.22	.23	.23	.22
.15	.13	.19	.13	Pale gen chips spot.....lb.	.14½	.15	.15	.14½
.14	.13	.14	.13	Elemi, No. 1, 80-85 lb cs...lb.	.13½	.14	.14	.13½
.13½	.13	.13	.12	No. 2, 80-85 lb cases.....lb.	.13	.13½	.13½	.13
.13	.12	.13	.11	No. 3, 80-85 lb cases.....lb.	.12	.13	.13	.12
				Kauri, 224-226 lb cases No. 1				
.57	.50	.67½	.57	.....lb.	.50	.57	.57	.50
.38	.35	.44½	.38	No. 2 fair pale.....lb.	.35	.38	.38	.35
				Brown Chips, 224-226 lb				
.12	.10	.14½	.10	cases.....lb.	.10	.12	.12	.10
.....	.....	.42	.38	Bush Chips, 224-226 lb	.....	.....		
.40	.38	.....	.....	cases.....lb.	.38	.40	.40	.38
.....	.....	.....	.....	Pale Chips, 224-226 lb cases				
.26	.24½	.31½	.24½	.....lb.	.24½	.26	.26	.24½
				Sandarac, prime quality, 200				
.60	.26	.27	.25	lb bags & 300 lb casks...lb.	.67	.68	.68	.60
.....	.....	.....	.....	Helium, 1 lit. bot.....lit.	.....	25.00	.20	.17
.20	.17	.12	.12	Hematine crystals, 400 lb bbls lb.	.17	.20	.11	.17
.11	.11	.09	.09	Paste, 500 bbls.....lb.	.....	.11	.11	.11
.03¾	.03½	.03½	.03½	Hemlock 25%, 600 lb bbls wks lb.	.03½	.03½	.03¾	.03½
16.00	16.00	16.00	16.00	Bark.....ton	.....	17.00	17.00	16.00
.60	.60	.60	.45	Hexalene, 50 gal drs wks.....lb.	.....	.60	.60	.60
.56	.62	.80	.62	Hexamethylenetetramine, drs .lb.	.56	.58	.58	.56
4.00	4.00	3.35	2.75	Hoof Meal, fob Chicago....unit	.....	3.85	4.00	3.90
.....	.....	3.90	3.0	South Amer. to arrive....unit	.....	3.85	3.90	3.85
				Hydrogen Peroxide, 100 vol, 140				
.26	.24	.30	.22	lb cbys.....lb.	.24	.26	.26	.24
.15	.12	.12	.12	Hypernic, 51°, 600 lb bbls....lb.	.12	.15	.15	.12
1.30	1.28	1.28	1.20	Indigo Madras, bbls.....lb.	1.28	1.30	1.30	1.28
.18	.15	.15	.18	20% paste, drums.....lb.	.15	.18	.18	.15
.08	.07½	.07½	.07½	Solid, powder.....lb.	.07½	.08	.08	.07½
				Iron Chloride, see Ferric or				
				Ferrous				
.10	.09	.09	.09	Iron Nitrate, kegs.....lb.	.09	.10	.10	.09
3.25	2.50	2.50	2.50	Coml, bbls.....100 lb.	2.50	3.25	3.25	2.50
.12	.10	.10	.10	Oxide, English.....lb.	.10	.12	.12	.10
.03¾	.02½	.02½	.02½	Red, Spanish.....lb.	.02½	.03½	.03¾	.02½
.90	.85	.85	.85	Isopropyl Acetate, 50 gal drs gal.	.85	.90	.90	.85
.20	.17	.29	.17	Japan Wax, 224 lb cases.....lb.	.....	.17	.18	.17
70.00	60.00	60.00	60.00	Kieselguhr, 95 lb bgs NY....ton	60.00	70.00	70.00	60.00
.....	.....	14.00	13.00	Lead Acetate, bbls wks...100 lb.	13.00	13.50	13.50	13.00
				White crystals, 500 lb bbls				
13.50	13.00	14.00	13.00	wks.....100 lb.	14.00	14.50	14.50	14.00
.15	.13	.15½	.13½	Arsenate, drs 1c-1 wks.....lb.	.13	.15	.15	.13
				Dithiofuroate, 100 lb dr....lb.	.....	1.00		
6.25	6.25	7.80	6.20	Metal, c-1 NY.....100 lb.	.....	7.75	7.75	6.10
.14	.14	.14	.14	Nitrate, 500 lb bbls wks....lb.	.....	.14	.14	.14
.18	.17½	.17½	.17½	Oleate, bbls.....lb.	.17½	.18	.18	.17½
.08¼	.08½	.10½	.08½	Oxide Litharge, 500 lb bbls.lb.	.....	.08½	.08¾	.08½
.09¼	.09½	.11½	.09½	Red, 500 lb bbls wks....lb.	.....	.09½	.09¾	.09½
.09	.09	.09¾	.09	White, 500 lb bbls wks...lb.	.....	.09½	.09¾	.09
.08¼	.08¼	.09	.08¼	Sulfate, 500 lb bbls wk...lb.	.....	.08½	.08¾	.08¼
4.50	4.50	4.50	4.50	Lime, ground stone bags.....ton	.....	4.50	4.50	4.50
1.05	1.05	1.05	1.05	Live, 325 lb bbls wks...100 lb.	.....	1.05	1.05	1.05
				Lime Salts, see Calcium Salts				
.17	.15	.15	.15	Lime-Sulfur soln bbls.....gal.	.15	.17	.17	.15
				Lithopone, 400 lb bbls 1c-1 wks				
.06½	.06½	.06½	.06½	.....lb.	.....	.05½	.06½	.05½
.08½	.08½	.08½	.08½	Logwood, 51°, 600 lb bbls.....lb.	.08½	.08½	.08½	.08½
.03½	.03	.03	.03	Chips, 150 lb bags.....lb.	.03	.03½	.03½	.03
.12½	.12½	.12	.12	Solid, 50 lb boxes.....lb.	.....	.12½	.12½	.12½
27.00	26.00	26.00	26.00	Sticks.....ton	24.00	26.00	26.00	24.00
.08	.07½	.07½	.07½	Lower grades.....lb.	.07½	.08	.08	.07½
.30	.30	.30	.30	Madder, Dutch.....lb.	.22	.25	.25	.22
50.00	48.00	48.00	48.00	Magnesite, calc, 500 lb bbl...ton	50.00	60.00	60.00	50.00
				Magnesium				
				Magnesium Carb, tech, 70 lb				
.06½	.06	.06½	.06	bags NY.....lb.	.06	.06½	.06½	.06

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the annual supply going to that country. Figures for 1927 follow: United States, 1,261 tons; United Kingdom, 255; British India and Burma, 103; Australia, 84; other countries, 177.

Lead Arsenate — Has been in excellent demand along with the line-sulfur solution as the spraying season matures. Despite advances in lead no price revisions have been made as yet.

Logwood — A report from Consul Jose de Olivares, Kingston, states that exports of logwood extract to the United States from Jamaica during the calendar year 1928 amounted to 104,819 pounds, valued at $17,236, as compared with 111,262 pounds, declared at $18,557, exported in 1927, resulting in a decrease in quantity of 6,443 pounds, and in declared value of $1,321.

Mercury — Has advanced further during the month and is now quoted at $124.00 @ $125.00 in a firm market. Very little domestic material has been available and there is every indication that prices will show no decline within the near future. Exports of quicksilver directly to the United States from Alicante and Madrid steadily increased from 1924 to 1927, but in 1928 there was a marked decline. The quantities and values during the last five years follow:—

	From Alicante		*From Madrid*	
	Pounds	*Value*	*Pounds*	*Value*
1924....	....	....	80,716	$ 46,212
1925....	206,250	$165,489	623,346	506,910
1926....	252,700	229,549	884,265	816,825
1927....	507,680	510,194	586,216	880,219
1928....	91,200	130,912	330,908	456,166

The high prices demanded by the company having the monopoly for the sale of mercury from the government mines is given as one reason for the change, and it is also possible that large indirect shipments were made. The Spanish government-owned Almaden mine produces fully 97 per cent. of the Spanish output. Spain's quicksilver exportation in 1926 amounted to 1,678 metric tons, valued at 9,899,610 pesetas, and in 1927 to 1,561 metric tons, valued at 12,395,928 pesetas.

Phenol — The scarcity of this material continues with no sign of any easing of the situation. Potential production seems big enough but the producers have not yet caught up with tremendous demands made by the entry of so many into the manufacture of synthetic resins, with the recent expiration of patents covering these products.

Phosphate Rock — Total quantity of phosphate rock sold or used by producers in the United States in 1928 was 3,439,921 long tons, valued at $12,339,850, states the Department of Commerce in summarizing figures compiled by the United States Bureau of Mines from individual

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Chloride flake, 375 lb. drs c-l wks.....ton	.....	36.00	36.00	36.00
37.00	27.00	37.00	37.00	Important shipment....ton	.....	33.00	33.00	33.00
33.00	33.00	33.00	33.00	Fused, imp, 900 lb bbls NY ton	.....	31.00	31.00	31.00
31.00	31.00	31.00	31.00	Fluosilicate, crys, 400 lb bbls wks.....lb.	.10	.10½	.10½	.10
.10½	.10	.10	.10	Oxide, USP, light, 100 lb bbls .....lb.	.....	.42	.42	.42
.42	.42	.42	.42	Heavy, 250 lb bbls.....lb.	.....	.50	.50	.50
.50	.50	.50	.50	Peroxide, 100 lb cs.....lb.	.....	1.25	1.25	1.25
.....	.....	.....	.....	Silicofluoride, bbls.....lb.	.09½	.10½	.10½	.09½
.10½	.09½	.12½	.09½	Stearate, bbls.....lb.	.25	.26	.26	.25
.25	.23	.23	.23	Manganese Borate, 30%, 200 lb bbls.....lb.	.....	.19	.24	.19
.24	.24	.24	.24	Chloride, 600 lb casks.....lb.	.08	.08½	.08½	.08
.08½	.08	.08	.08	Dioxide, tech (peroxide) drs lb.	.04½	.06	.06	.04½
.....	.....	.05	.04½	Ore, powdered or granular				
.50	.35	.....	.....	75-80%, bbls.....lb.	.03	.03½	.03½	.03
.03½	.03	.03	.03	80-85%, bbls.....lb.	.04	.04½	.04½	.04
.04½	.04	.04	.04	85-88%, bbls.....lb.	.05	.05½	.05½	.05
.05½	.05	.05	.05	Sulfate, 550 lb drs NY.....lb.	.08	.08½	.08½	.08
.07½	.07	.07	.07	Mangrove 55%, 400 lb bbls...lb.	.03½	Nom.	Nom.	.03½
Nom.	.03½	.03½	.03½	Bark, African.....ton	.....	32.00	35.00	30.00
45.00	35.00	39.00	34.00	Marble Flour, bulk.....ton	14.00	15.00	15.00	14.00
12.00	10.00	10.00	10.00	Mercury metal.....75lb flask	124.00	124.50	124.50	120.00
132.00	121.00	129.00	99.00	Meta-nitro-aniline.....lb.	.72	.74	.74	.72
.74	.72	.72	.72	Meta-nitro-para-toluidine 200 lb. bbls.....lb.	1.50	1.55	1.55	1.50
1.80	1.50	1.70	1.70	Meta-phenylene-diamine 300 lb. bbls.....lb.	.84	.90	.90	.84
.94	.90	.90	.90	Meta-toluene-diamine, 300 lb bbls.....lb.	.70	.72	.72	.70
.74	.72	.72	.72					
				Methanol				
				Methanol, (Wood Alcohol), drs 95%.....gal.	.58	.65	.65	.58
.58	.46	.80	.55	97%, drums c-1.....gal.	.60	.65	.65	.60
.60	.47	.87	.57	Pure, drums lc-1.....gal.	.65	.68	.68	.65
.63	.44	.....	.....	Synthetic, drums c-1.....gal.	.63	.66	.66	.63
.58	.48	.....	.....	Denat. gre. tanks.....gal.	.60	.62	.62	.60
.75	.45	.80	.75	Methyl Acetate, drums.....gal.	.....	.95	.95	.95
.95	.95	.95	.95	Acetone, 100 gal drums...gal.	.83	.85	.85	.83
.90	.68	.88	.75	Anthraquinone, kegs.....lb.	.85	.95	.95	.85
.95	.85	1.00	.85	Cellosolve, (See Ethylene Glycol Mono Methyl Ether)	.....	.....	.60	.55
.....	.....	.....	.....	Chloride, 90 lb cyl.....gal.	.55	.60	.....	.....
60	.55	.55	55	Furoate, 1 lb tins.....lb.	.....	5.00	5.00	5.00
80.00	65.00	.03½	.03½	Mica, dry grd. bags wks.....lb.	65.00	80.00	80.00	65.00
115.00	110.00	.05½	.05½	Wet, ground, bags wks.....lb.	110.00	115.00	115.00	110.00
.....	.....	3.00	3.00	Michler's Ketone, kegs.....lb.	.....	3.00	3.00	3.00
.75	.70	.70	.70	Monochlorobenzene, drums see, Chorobenzene, mono.....lb.	.70	.75	.75	.70
1.05	1.05	1.05	1.05	Monoethylorthotoluidin, drs. lb.	.....	1.05	1.05	1.05
4.20	3.95	3.95	3.95	Monomethylaniline, 900 lb dr .....lb.	3.95	4.20	4.20	3.95
.07	.06½	.06½	.06½	Monomethylparaminosufate 100 lb drums.....lb.	.06½	.07	.07	.06½
.04½	.04½	.04	.04	Montan Wax, crude, bags....lb.	.04½	.04½	.04½	.04½
.08½	.08	.08	.08	Myrobalans 25%, liq bbls....b	.04½	.04½	.04½	.04½
50.00	42.00	43.50	41.00	50% Solid, 50 lb boxes.....lb.	.08	.08½	.08½	.08
40.00	32.50	37.00	23.50	J1 bags.....ton	.....	42.00	43.00	40.00
40.00	32.50	37.00	30.00	J 2 bags.....ton	.....	30.00	40.00	30.00
				R 2 bags.....ton	.....	30.00	34.00	30.00
.18	.18	.21	.18	Naphtha, v. m. & p. (deodorized) bbls.....gal.	.....	.18	.18	.18
.06	.05½	.06	.05½	Naphthalene balls, 250 lb bbls wks.....lb.	.....	.05½	.05½	.05½
.04½	.04½	.04½	.04½	Crushed, chipped bgs wks..lb.	.....	.04½	.04½	.04½
.05	.05	.05	.04½	Flakes, 175 lb bbls wks....lb.	.....	.05	.05	.05
.24	.21	.21	.21	Nickel Chloride, bbls kegs....lb.	.21	.24	.24	.21
.38	.35	.35	.35	Oxide, 100 lb kegs NY.....lb.	.37	.40	.40	.37
.09½	.09	.09	.08½	Salt bbl. 400 bbls lb NY...lb.	.....	.13	.13	.13
.09	.08½	.08½	.08	Single, 400 lb bbls NY.....lb.	.....	.13	.13	.13
1.30	1.25	1.25	1.10	Nicotine, free 40%, 8 lb tins, cases.....lb.	1.25	1.30	1.30	1.25
1.20	.98½	1.10	1.10	Sulfate, 10 lb tins.....lb.	.98½	1.20	1.20	.98½
14.00	13.00	13.00	13.00	Nitre Cake, bulk.....ton	12.00	16.00	16.00	12.00
.10½	.10½	10½	.09½	Nitrobenzene, redistilled, 1000 lb drs wks.....lb.	.10½	.10½	.10½	.10½
Nom.	.40	.40	.40	Nitrocellulose, regular drums wks.....lb.	.40	Nom.	Nom.	.40
				Low viscosity (soln only)				
Nom.	.55	.55	.55	Grade 1 drums, wks.....lb.	.55	Nom.	Nom.	.55
Nom.	.50	.50	.50	Grade 2 drums, wks.....lb.	.50	Nom.	Nom.	.50
4.00	3.35	3.60	3.35	Nitrogenous Material, bulk..unit	.....	4.00	4.00	4.00
.25	.25	.25	.25	Nitronaphthalene, 550 lb bbls.lb.	.....	.25	.25	.25
.15	.14	.14	.14	Nitrotoluene, 1000 lb drs wks.lb.	.14	.15	.15	.14
Nom.	.25	.25	.25	Nutgalls Aleppy, bags.....lb.	.16	.16½	.16½	.16
.18	.17	.17	.17	Chinese, bags.....lb.	.12	.13	.13	.12
.24	.22	.22	.22	Powdered, bags.....lb.	.22	.24	.24	.22
.03½	.03½	.03½	.03½	Oak, tanks, wks.....lb.	.....	.03½	.03½	.03½
.04½	.04	.04	.04	23-25% liq., 600 lb bbl wk lb.	.04	.04½	.04½	.04
50.00	45.00	45.00	45.00	Oak Bark, ground.....ton	45.00	50.00	50.00	45.00
23.00	20.00	20.00	20.00	Whole.....ton	20.00	23.00	23.00	20.00
.13½	.13	.14½	.13	Orange-Mineral, 1100 lb casks NY.....lb.	.12½	.13½	.13½	.12½
2.25	2.20	2.20	2.20	Orthoaminophenol, 50 lb kgs..lb.	2.20	2.25	2.25	2.20
2.50	2.35	2.50	2.35	Orthoanisidine, 100 lb drs....lb.	2.50	2.60	2.60	2.50
.65	.50	.50	.50	Orthochlorophenol, drums....lb.	.50	.65	.65	.50
.28	.18	.18	.18	Orthocresol, drums.....lb.	.18	.28	.28	.18
.07	.06	.06	.06	Orthodichlorobenzene, 1000 lb drums.....lb.	.07	.10	.10	.07
.35	.32	.32	.32	Orthonitrochlorobenzene, 1200 lb drs wks.....lb.	30	.33	.33	.30

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reports furnished by producers. The figures for Florida were collected in co-operation with the State Geological Survey. The compilation indicates an increase of eight per cent. in quantity and 10 per cent. in value, as compared with 1927. Florida continued to lead in production, and was the source of 82 per cent. of all the phosphate rock sold or used by producers in the United States in 1928. Imports of phosphate rock in 1928 were 45,812 long tons, valued at $431,238, or an increase of 62 per cent. in quantity and 47 per cent. in value, as compared with 1927. Exports amounted to 898,764 long tons, valued at $4,453,101, a decrease of two per cent. in quantity and six per cent. in value, as compared with 1927, and included 92,517 tons of hard rock, valued at $626,238, and 806,247 tons of land pebble and other rock, valued at $3,826,863.

Salt Cake — Has been in exceptionally good demand, but as yet there have been no price changes from $19.00 @ $20.00 per ton. Supplies have become rather scarce and advances in price would not be surprising.

Shellac — Has been quiet and dull, with buying confined to the hand-to-mouth variety. Garnet and superfine are lower at 43c @ 54c lb. and 46c @ 47c lb. respectively.

Soda Ash — Continues in firm condition and in good demand although still secondary to that for soda caustic.

Soda Caustic — Demand has continued to be more pronounced than that for soda ash and producers are working to capacity to keep up with increasing demands especially from the rayon industry. In spite of this increasing domestic consumption, the United States is maintaining its position as the world's second largest exporter of caustic soda, owing to steadily increasing production, according to the Department of Commerce. In the world's foreign trade in caustic soda, which totals about 220,000 tons annually, the United States supplies about 60,000 tons, or 27 per cent., which is 10 per cent., of its national production of nearly 600,000 tons a year. Britain leads, with about half; France ranks third, with approximately 17 per cent., and Germany in 1927 obtained about 5 per cent., while Spain, Yugoslavia and Russia receive smaller shares of the foreign trade in caustic soda. The United States caustic soda production in 1927 was 171,000 tons greater than in 1919 and 147,000 tons more than in 1923. The ratio of caustic soda exports to production has not changed appreciably in the period 1921 to 1927. The quantities exported, however, have remained fairly constant since 1923, despite a 35 per cent

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Orthonitrotoluene, 1000 lb drs wk...lb.	.17	.18	.17
.18	.17	.13	.13	Orthonitrophenol, 350 lb dr...lb.	.85	.90	.85
.90	.85	.85	.85	Orthotoluidine, 350 lb bbl 1c-1 lb.	.25	.30	.25
.31	.29	.29	.25	Orthonitroparachlorphenol, tins ...lb.	.70	.75	.70
.75	.70	.70	.70	Osage Orange, crystals...lb.	.16	.17	.16
.17	.16	.16	.16	51 deg. liquid...lb.	.07	.07½	.07
.07	.07	.07	.07	Powdered, 100 lb bags...lb.	.14½	.15	.14½
.15	.14½	.14½	.14½	Paraffin, refd, 200 lb cs slabs			
.06¾	.06½	.06½	.06½	123-127 deg. M. P...lb.	.06	.06½	.06¾
.07¼	.07¼	.07½	.07½	128-132 deg. M. P...lb.	.06½	.06¾	.07
.08¼	.08	.08	.08	133-137 deg. M. P...lb.	.07½	.07¾	.07¾
.10	.08¾	.08¾	.08¾	138-140 deg. M. P...lb.	.08	.09	.09
.28	.20½	.29	.26	Para Aldehyde, 110-55 gal drs..lb.	.20½	.23	.28
1.05	1.00	1.00	1.00	Aminoacetanilid, 100 lb bg..lb.	1.00	1.05	1.05
				Aminohydrochloride, 100 lb kegs...lb.	1.25	1.30	1.30
1.30	1.25	1.25	1.25	Aminophenol, 100 lb kegs..lb.	.....	1.15	1.15
1.15	1.15	1.15	1.15	Chlorophenol, drums...lb.	.50	.65	.65
.65	.50	.50	.50	Coumarone, 330 lb drums..lb.	.....	.....	.....
.....	.....	.12	.12	Cymene, refd, 110 gal dr..gal.	2.25	2.50	2.50
2.50	2.25	2.25	2.25	Dichlorobenzene, 150 lb bbls wks...lb.	.17	.20	.20
.20	.17	.17	.17	Nitroacetanilid, 300 lb bbls..lb.	.50	.55	.55
.55	.50	.53	.50	Nitroaniline, 300 lb bbls wks ...lb.	.48	.59	.49
.59	.48	.52	.52	Nitrochlorobenzene, 1200 lb drs wks...lb.	.23	.26	.26
.32	.32	.32	.32	Nitro-orthotoluidine, 300 lb bbls...lb.	2.75	2.85	2.85
2.85	2.75	2.75	2.75	Nitrophenol 185 lb bbls...lb.	.50	.55	.55
.55	.50	.50	.50	Nitrosodimethylaniline, 120 lb. bbls...lb.	.92	.94	.94
.94	.92	.92	.92	Nitrotoluene, 350 lb bbls...lb.	.....	.30	.30
.30	.30	.30	.25	Phenylenediamine, 350 lb bbls ...lb.	1.15	1.20	1.20
1.20	1.15	1.20	1.15	Toueneulfonamide, 175 lb bbls...lb.	.70	.75	.75
.41	.40	.40	.40	Toluenesulfonchloride, 410 lb bbls wks...lb.	.20	.22	.22
.22	.20	.20	.18	Toluidine, 350 lb bbls wk...lb.	.40	.42	.42
.42	.40	.45	.38	Paris Green, Arsenic Basis			
.25	.20	.21	.21	100 lb kegs...lb.	.....	.27	.27
.23	.17	.19	.19	250 lb kegs...lb.	.....	.25	.25
.....	.....	.25	.25	Persian Berry Ext., bbls...lb.	.25	Nom.	.25
.03	.02½	.02½	.02½	Petrolatum, Green, 300 lb bbl.lb.	.02	.02½	.02½
.13	.20	.18	.16	Phenol, 250-100 lb drums...lb.	.13½	.16	.16
1.35	1.35	1.35	1.28	Phenyl - Alpha - Naphthylamine, 100 lb kegs...lb.	.....	1.35	1.35

Phosphate

				Phosphate Rock, f.o.b. mines			
3.15	3.00	3.00	3.00	Florida Pebble, 68% basis..ton	3.00	3.15	3.15
3.65	3.50	3.50	3.50	70% basis...ton	3.75	4.00	4.00
4.15	4.00	4.00	3.85	72% basis...ton	4.25	4.50	4.50
5.00	5.00	5.35	5.00	75-74% basis...ton	5.25	5.50	5.50
5.75	5.75	5.75	5.60	75% basis...ton	.....	5.75	5.75
6.25	6.25	6.25	6.00	77-76% basis...ton	.....	6.25	6.25
5.00	5.00	5.50	5.00	Tennessee, 72% basis...ton	.....	5.00	5.00
				Phosphorous Oxychloride 175 lb cyl...lb.	.35	.40	.40
.40	.35	.35	.35	Red, 110 lb cases...lb.	.55	.60	.60
.65	.60	.65	.60	Yellow, 110 lb cases wks..lb.	.....	.32	.32
.32	.32	.32	.32	Sesquisulfide, 100 lb cs...lb.	.....	.44	.46
.46	.46	.46	.46	Trichloride, cylinders...lb.	.....	.35	.35
.....	.....	.35	.35	Phthalic Anhydride, 100 lb bbls wks...lb.	.18	.20	.20
.20	.18	.18	.18	Pigments Metallic, Red or brown			
45.00	37.00	40.00	37.00	bags, bbls, Pa. wks...ton	37.00	45.00	45.00
				Pine Oil, 55 gal drums or bbls			
.64	.63	.63	.63	Destructive dist...lb.	.63	.64	.64
10.60	8.00	8.00	8.00	Prime bbls...bbl.	8.00	10.60	10.60
.70	.70	.70	.66	Steam dist. bbls...gal.	.65	.70	.70
				Pitch Hardwood,... wks...ton	40.00	45.00	45.00
45.00	40.00	40.00	40.00	Plaster Paris, tech, 250 lb bbls ...bbl.	3.30	3.50	3.50
3.30	3.30	3.30	3.30				

Potash

.07¼	.07¼	.07¼	.07¼	Potash, Caustic, wks...lb.	.....	.07¼	.07¼
.07½	.07½	.07½	.07½	Imported casks c-1...lb.	.....	.07½	.07½
				Potash Salts, Rough Kainit			
9.00	9.00	9.00	9.00	12.4% basis bulk...ton	.....	9.00	9.00
9.50	9.50	9.50	9.50	14% basis...ton	.....	9.50	9.50
				Manure Salts...			
12.40	12.40	12.40	12.40	20% basis bulk...ton	.....	12.40	12.40
18.75	18.75	18.75	18.75	30% basis bulk...ton	.....	18.75	18.75
36.40	36.40	36.40	36.40	Potassium Muriate, 80% basis bags...ton	.....	36.40	36.40
27.00	27.00	27.00	27.00	Pot. & Mag. Sulfate, 40% basis bags...ton	.....	27.00	27.00
47.30	47.30	47.30	47.30	Potassium Sulfate, 90% basis bags...ton	.....	47.30	47 30
.09½	.09	.09	.09	Potassium Bicarbonate, USP, 320 lb bbls...lb.	.13	.14	.14
.09½	.08½	.08½	.08	Bichromate Crystals, 725 lb casks...lb.	.09	.09½	.09½
.12¼	.12	.12	.11	Powd., 725 lb cks wks...lb.	.13	.13¼	.13¼

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increase in production, which has been absorbed by domestic consuming industries. The growth of 35 per cent. in United States caustic soda production from 1923 to 1927 has been partly absorbed by the rayon industry, which has developed largely since 1923, with annual requirements of 65,000 to 70,000 tons of caustic soda. Petroleum refinining and pulp and paper industries also have been large purchasers. Tonnage of caustic soda production in the United States is about one-fifth of the total tonnage of the bulk alkalies, including soda ash, caustic soda, modified sodas, salt cake, sal soda, and bicarbonate. The ratio of the value of the caustic soda to the total value of these alkalies is about 43 per cent. Soda ash holds a little stronger position at approximately 45 per cent.

Sodium Nitrate — The market continues very firm with prices unchanged. Amalgamation of Anglo-Chliean Nitrate with Lautaro Nitrate seems a foregone conclusion, and this combination would control nearly half the Chilean production. Discussions, which have been taking place in Chile, during the past two months, with a view to extending the Nitrate Producers' Association, for a lengthy period, terminated yesterday when, at an Extraordinary General Meeting of the Associates held in Valparaiso it was unanimously agreed to extend the life of the Association until June 30th, 1939; to incorporate into the Association the Selling Corporation formed in August 1928, and to introduce into the Statutes a number of new provisions giving the directorate wider powers of rapid action. The Anglo-Chilian Consolidated Nitrate Corporation becomes a member of the Nitrate Producers Association and its production will henceforward be sold under the rules of the Association, except as regards the United States market. A subsequent announcement was made by the Superintendent of Nitrate, on behalf of the President, declaring that the government will spare no efforts to help the Nitrate industry to increase its production and to extend its markets still further and to contribute to this policy that it will make use for the benefit of the industry of the ample powers which the Nitrate Law gives it. From the above far-reaching declaration, it may be assumed that the help which is being accorded to the industry during the current year—estimated at about £2,000,000—will be on a rising scale in the future. Under the Nitrate Law referred to, the Chilean Government have power to subsidize the Nitrate Industry with any surplus receipts from Nitrate and Iodine duties over £4,250,000, of which sum

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.17	.16	.16	.16	Binoxiate, 300 lb bbls....lb.	.16	.17	.16
.30	.30	.30	.30	Bisulfate, 100 lb kegs....lb.	.....	.30	.30	.30
.05½	.05½	.05½	.05½	Carbonate, 80-85% calc. 800 lb casks....lb.	.05½	.05½	.05½	.05½
.09	.06½	.08½	.08½	Chlorate crystals, powder 112 lb keg wks....lb.	.08½	.09	.09	.08½
.08½	.07½	.08½	.08½	Imported 112 lb kegs NY....lb...	.07½	.07½	.07½	.07½
.05½	.05½	.05½	.05½	Chloride, crys bbls....lb.	.05½	.05½	.05½	.05½
.28	.27	.27	.27	Chromate, kegs....lb.	.27	.28	.28	.27
.57½	.55	.55	.55	Cyanide, 110 lb. cases....lb.	.55	.57½	.57½	.55
.12	.11½	.11½	.11½	Metabisulfite, 300 lb. bbl...lb.	.12	.13	.13	.11½
.17	.16	.16	.16	Oxalate, bbls....lb.	.20	.24	.24	.16
.12	.11	.11	.11	Perchlorate, casks wks....lb.	.11	.12	.12	.11
.15½	.15	.15½	.14½	Permanganate, USP, crys 500 & 100 lb drs wks....lb.	.16	.16½	.16½	.16
.38	.37	.39	.37½	Prussiate, red, 112 lb keg...lb.	.38	.40	.40	.38
.18½	.18	.18	.18	Yellow, 500 lb casks....lb.	.18½	.21	.21	.18½
.51	.51	.51	.51	Tartrate Neut, 100 lb keg..lb.	.....	.21	.51	.51
.25	.25	.25	.25	Titanium Oxalate, 200 lb bbls ....lb.	.21	.23	.25	.21
.....	.....	.....	.....	Propyl Furoate, 1 lb tins....lb.	.....	5.00	5.00	5.00
.05	.04	.04	.04	Pumice Stone, lump bags....lb.	.04	.05	.05	.04
.06	.04½	.04½	.04½	250 lb bbls....lb.	.04½	.06	.06	.04½
.03	.02½	.02½	.02½	Powdered, 350 lb bags....lb.	.02½	.03	.03	.02½
.03½	.03½	3.75	3.75	Putty, commercial, tubs..100 lb.	.....	.03½	.03½	.03½
.05½	.05½	5.50	5.50	Linseed Oil, kegs....100 lb.	.....	.05½	.05½	.05½
1.50	1.50	3.00	1.50	Pyridine, 50 gal drums....gal.	.....	1.75	1.75	1.50
.13½	.13	.13	.12	Pyrites, Spanish cif Atlantic ports bulk....unit	.13	.13½	.13½	.13
.04	.03	.03	.03	Quebracho, 35% liquid tks....lb.	.03½	.04	.04	.03½
.04½	.03½	.03½	.03½	450 lb bbls c-1....lb.	.03½	.04½	.04½	.03½
.05½	.04	.04	.04	35% Bleaching, 450 lb bbl .lb.	.04½	.05½	.04½	.05½
.05½	.05	.05	.04½	Solid, 63%, 100 lb bales cif..lb.	.05½	.05½	.05½	.05½
.05½	.05	.05	.05	Clarified, 64%, bales....lb.	.....	.05½	.05½	.05½
.06	.05½	.06½	.06½	Quercitron, 51 deg liquid 450 lb bbls....lb.	.05½	.06	.06	.05½
.13	.10	.10	.10	Solid, 100 lb boxes....lb.	.10	.13	.13	.10
14.00	14.00	14.00	14.00	Bark, Rough....ton	.....	14.00	14.00	14.00
35.00	34.00	34.00	34.00	Ground....ton	34.00	35.00	35.00	34.00
.46	.45	.45	.45	R Salt, 250 lb bbls wks....lb.	.45	.46	.46	.45
.....	.....	.18	.18	Red Sanders Wood, grd bbls..lb.	.....	.18	.18	.18
1.35	1.25	1.25	1.25	Resorcinol Tech, cans....lb.	1.15	1.25	1.25	1.15
.57	.57	.67	.57	Rosin Oil, 50 gal bbls, first run ....gal.	.....	.62	.62	.57
.62	.62	.72	.62	Second run....gal.	.....	.64	.64	.62
				Rosin				
9.75	8.20	13.00	8.50	Rosins 600 lb bbls 280 lb...unit B....	.....	7.85	8.30	7.85
9.80	8.25	13.00	8.50	D....	.....	8.45	8.65	8.45
9.95	8.60	13.15	8.50	E....	.....	8.45	9.10	8.45
10.10	8.65	13.20	8.50	F....	.....	9.25	9.30	9.20
10.10	8.75	13.25	8.50	G....	.....	9.45	9.45	9.25
10.10	8.75	13.30	8.50	H....	.....	9.50	9.50	9.35
10.15	8.80	13.35	8.55	I....	.....	9.50	9.50	9.35
10.15	8.85	14.80	8.65	K....	.....	9.45	9.55	9.45
10.30	8.85	15.00	8.80	M....	.....	9.60	9.85	9.60
11.00	9.15	15.85	9.15	N....	.....	9.60	10.30	9.60
11.65	10.15	16.60	10.50	WG....	.....	10.05	11.30	10.05
12.65	10.40	18.55	12.00	WW....	.....	11.00	12.30	11.00
30.00	24.00	24.00	24.00	Rotten Stone, bags mines....ton	24.00	30.00	30.00	24.00
.08	.07	.07	.07	Lump, imported, bbls....lb.	.07	.08	.08	.07
.12	.09	.09	.09	Selected bbls....lb.	.09	.12	.12	.09
.05	.02	.02	.02	Powdered, bbls....lb.	.02	.05	.05	.02
.05	.04½	.04½	.04½	Sago Flour, 150 lb bags....lb.	.04½	.05	.05	.04½
.....	.....	.90	.90	Sal Soda, bbls wks....100 lb.	.....	1.00	1.00	1.00
20.00	19.00	19.00	19.00	Salt Cake, 94-96% c-1 wks. .ton	19.00	20.00	20.00	19.00
17.00	15.00	15.00	15.00	Chrome....ton	12.00	15.00	17.00	12.00
.06½	.06½	.06½	.06½	Saltpetre, double refd granular 450-500 lb bbls....lb.	.06½	.06½	.06½	.06½
.01½	.01½	.01½	.01½	Satin, White, 500 lb bbls....lb	.....	.01½	.01½	.01½
.62½	.49	.66	.47	Shellac Bone dry bbls....lb.	.....	.61	.61	.59
.55	.45	.57	.41	Garnet, bags....lb.	.. ..	.43	.45	.43
.58	.47	.65	.40	Superfine, bags....lb.	.....	.46	.47	.46
.55	.42	.37	.57	T. N. bags....lb.	.....	.42	.44	.43
.57	.53	.50	.50	Schaeffer's Salt, kegs....lb.	.53	.57	.57	.53
11.00	8.00	6.00	6.00	Silica, Crude, bulk mines....ton	8.00	11.00	11.00	8.00
30.00	22.00	15.00	15.00	Refined, floated bags....ton	22.00	30.00	30.00	22.00
.....	.....	32.00	32.00	Air floated bags....ton	.....	32.00	32.00	32.00
40.00	32.00	55.00	55.00	Extra floated bags....ton	32.00	40.00	40.00	32.00
22.00	15.00	15.00	15.00	Soapstone, Powdered, bags f. o. b. mines....ton	15.00	22.00	22.00	15.00
				Soda				
1.40	1.40	1.32½	1.32½	Soda Ash, 58% dense, bags c-1 wks....100 lb.	.....	1.40	1.40	1.40
2.29	2.40	2.14	2.04	58% light, bags....100 lb.	.....	1.34½	1.34½	1.34½
1.32½	1.32½	1.32½	1.32½	Contract, bags c-1 wks.100 lb.	.....	1.32	1.32	1.32
4.21	4.16	4.16	4.06	Soda Caustic, 76% grnd & flake drums....100 lb.	.....	3.35	3.35	3.35
3.91	3.76	3.76	3.66	76% solid drs....100 lb.	.....	2.95	2.95	2.95
3.00	3.00	3.00	3.00	Contract, c-1 wks....100 lb.	.....	2.90	2.90	2.90
.05	.04½	.04½	.04½	Sodium Acetate, crystals, 450 lb. bbls wks....lb.	.05½	.06	.06	.05
.....	.....	.19	.18	Arsenate, drums....lb.	.18	.19	.19	.18
.....	.....	1.00	1.00	Arsenite, drums....gal.	1.00	1.50	1.50	1.00
2.41	2.41	2.41	2.41	Bicarb, 400 lb bbl NY..100 lb.	.....	2.41	2.41	2.41

Iodine at present contributes £150,000, leaving a minimum to be obtained from Nitrate of £4,100,000. On the basis of shipments in 1928, viz:—2,756,000 tons—duties received amounted to about £6, 900,000, leaving a surplus of £2,800,000. If shipments reached 3,000,000 tons, the surplus would be £3,425,000, or if 3,250, 000 tons, it would be £4,050,000.

Summary of the position as of February 28 gives total visible supply of 2,055,000 tons, as compared with 1,358,000 tons last year. According to the Chilean Minister of Finance, the total production of nitrate during the seven months ended January, 1929, was 19,342,556 quintals, as compared with 12,877,086 quintals in the corresponding 1927-8 period; the total exports amounted to 18,926,419 quintals, as compared with 18,291,240 quintals in the corresponding 1927-8 period. Imports into the United States during 1928 increased approximately 38 per cent., from 748,782 tons to 1,032,911 tons.

Tetrachlorethane — Incoming shipments to the United States of this material in 1928 dropped 34 per cent. compared with 1927, while imports of trichlosoethylene were nearly double the total of the three previous years. The following table shows the quantities and values of imports during the last six years of each solvent:

	Tetrachloroethane		Trichloroethylene	
	Pounds	*Value*	*Pounds*	*Value*
1923....	429,303	$20,130	198,522	$9,701
1924....	216,585	7,079	254,743	9,958
1925....	375,129	13,740	77,602	3,519
1926....	33,444	1,772	22	3
1927....	72,977	3,735	2,567	184
1928....	47,862	2,544	155,626	9,477

OILS AND FATS

Chinawood Oil — Increased demand and stronger conditions in the primary market have led to an advance of 5/8c lb. during the past month on tank cars at the Coast. Quotations are now at 13⅛c @ 13¼c lb., while the barrel price remains unchanged on spot. Export statistics indicate that a reduction was made in exports of the commodity from Shanghai to the United States in 1928. The respective quantities and value for the comparative years 1927 and 1928 were 4,484, 008 pounds, value $653,013; and 3,083,013 pounds valued at $392,812, or 25 per cent. of the total tung oil imports from China. On the other hand, shipments of tung oil from Hong Kong in 1928 were over a million pounds in excess of the preceding year. The quantities and values for the two years were, respectively, 10,680,763 pounds, value $1,801,245, and 11,984,748 pounds, value $1,624,331. These figures represent about 12 per cent. in quantity of

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.07	.06½	.06½	.06½	Bichromate, 500 lb cks wks..lb.	.07½	.07½	.07½
.04	.04	.08½	.08½	Bisulfite, 500 lb bbl wks....lb.	.....	.04	.04
1.35	1.30	1.30	1.30	Carb. 350 lb bbls NY..100 lb.	1.30	1.35	1.35
.06½	.05½	.06½	.06½	Chlorate, 112 lb kegs wks..lb.	.06½	.07	.07
13.00	12.00	12.00	12.00	Chloride, technical.....ton	12.00	13.00	13.00
.20	.20	.20	.20	Cyanide, 96-98%, 100 & 250 lb drums wks.....lb.	.18	.20	.20
.09	.08½	.08½	.08½	Fluoride, 300 lb bbls wks...lb.	.08½	.09	.09
.24	.22	.22	.22	Hydrosulfite, 200 lb bbls f. o. b. wks.....lb.	.22	.24	.24
.05	.05	.05	.05	Hypochloride solution, 100 lb cbys.....lb.	.....	.05	.05
3.05	2.65	2.65	2.65	Hyposulfite, tech, pea cyrs 375 lb bbls wks.....100 lb.	2.65	3.05	3.05
2.65	2.40	2.40	2.40	Technical, regular crystals 375 lb bbls wks....100 lb.	2.40	2.65	2.65
.45	.45	.70	.45	Metanilate, 150 lb bbls.... lb.	.....	.45	.45
.....	.....	.02½	.02½	Monohydrate, bbls.....lb.	.....	.02½	.02½
.57	.55	.55	.55	Naphthionate, 300 lb bbl...lb.	.55	.57	.57
2.45	2.12½	2.67	2.25	Nitrate, 92%, crude, 200 lb bags c-1 NY.....100 lb.	.....	2.22½	2.22½
.08½	.07½	.08½	.08	Nitrite, 500 lb bbls spot....lb.	.07½	.08	.08
.27	.25	.25	.25	Orthochlorotoluene, sulfonate, 175 lb bbls wks.....lb.	.25	.27	.27
.23	.20	.20	.20	Oxalate Neut, 100 lb kegs..lb.	.37	.42	.42
3.90	3.90	3.90	3.90	Paratoluene, tri-sodium, tech. 100 lb bbls c-1....100 lb.	.....	3.90	3.90
.09	.08	.08	.08	Sulfonate, 175 lb bbls....lb.	.08	.09	.09
.22	.21	.21	.21	Perborate, 275 lb bbls.....lb.	.18	.20	.22
3.55	3.25	3.25	3.25	Phosphate, di-sodium, tech. 310 lb bbls.....100 lb.	3.25	3.55	3.55
.....	.....	.....	.....	tri-sodium, tech, 325 lb bbls.....100 lb.	3.90	4.00	4.00
.72	.69	.69	.69	Picramate, 100 lb kegs.....lb.	.69	.72	.72
.12½	.12	.12	.11	Prussiate, Yellow, 350 lb bbl wks.....lb.	.12	.12½	.12½
.14	.13½	.13½	.13½	Pyrophosphate, 100 lb keg..lb.	.15	.20	.20
1.45	1.20	1.20	1.20	Silicate, 60 deg 55 gal drs, wks .....100 lb.	.....	1.65	1.65
1.10	.85	.85	.85	40 deg 55 gal drs, wks .....100 lb.	.70	.80	.80
.05	.05	.04½	.04½	Silicofluoride, 450 lb bbls NY .....lb.	.05	.05½	.05½
.49	.48½	.48½	.48½	Stannate, 100 lb drums....lb.	.41½	.42	.43
.29	.18	.20	.20	Stearate, bbls.....lb.	.25	.29	.29
.18	.16	.16	.16	Sulfanilate, 400 lb bbls.....lb.	.16	.18	.18
.02½	.02½	.02½	.02½	Sulfate Anhyd, 550 lb bbls c-1 wks.....lb.	.02½	.02¾	.02¾
.02½	.02½	.02½	.02½	Sulfide, 30% crystals, 440 lb bbls wks.....lb.	.02½	.02¾	.02¾
.04	.03½	.03½	03½	62% solid, 650 lb drums 1c-1 wks.....lb.	.03½	.04	.04
.03½	.03½	.03½	.03½	Sulfite, crystals, 400 lb bbls wks.....lb.	.03½	.03½	.03½
.50	.40	.40	.40	Sulfocyanide, bbls.....lb.	.66	.76	.76
.85	.80	.85	.80	Tungsten, tech, crystals, kegs .....lb.	.80	.85	.85
.40	.35	.40	.35	Solvent Naphtha, 110 gal drs wks.....gal.	.35	.40	.40
.01⅛	.01⅛	.01⅛	.01⅛	Spruce, 25% liquid, bbls.....lb.	.....	.01⅛	.01⅛
.01	.01	.01	.01	25% liquid, tanks wks.....lb.	.....	.01	.01
.02½	.02	.02	.02	50% powd, 100 lb bag wks lb.	.02	.02½	.02½
4.42	3.07	3.22	3.07	Starch, powd., 140 lb bags .....100 lb.	3.82	4.02	4.02
4.32	2.97	3.12	2.97	Pearl, 140 lb bags.....100 lb.	3.72	3.92	3.92
.06¾	.05¾	.06	.04¾	Potato, 200 lb bags.....lb.	.05¾	.06¼	.06¼
.06¾	.05¾	.06¼	.06¼	Imported bags.....lb.	.05¾	.06¼	.06¼
.08½	.08	.08	.06	Soluble.....lb.	.08	.08½	.08½
.10	.09½	.09½	.09	Rice, 200 lb bbls.....lb.	.09½	.10	.10
.07	.06½	.06½	.06½	Wheat, thick bags.....lb.	.06½	.07	.07
.10	.09½	.09½	.09½	Thin bags.....lb.	.09½	.10	.10
.07½	.07¼	.07¼	.07¼	Strontium carbonate, 600 lb bbls wks.....lb.	.07¼	.07½	.07½
.09	.08¾	.08¾	.08	Nitrate, 600 lb bbls NY....lb.	.09	.09¼	.09¼
.....	.....	.....	.....	Peroxide, 100 lb drs.....lb.	.....	1.25	1.25

Sulfur

2.05	2.05	2.05	2.05	Sulfur Brimstone, broken rock, 250 lb bag c-1.....100 lb.	.....	2.05	2.05
19.00	18.00	18.00	18.00	Crude, f. o. b. mines.....ton	18.00	19.00	19.00
2.40	2.40	2.40	2.40	Flour for dusting 99½%, 100 lb bags c-1 NY....100 lb.	.....	2.40	2.40
2.50	2.50	2.50	2.50	Heavy bags c-1.....100 lb.	.....	2.50	2.50
3.45	3.45	3.45	3.45	Flowers, 100%, 155 lb bbls c-1 NY.....100 lb.	.....	3.45	3.45
2.85	2.65	2.65	2.65	Roll, bbls 1c-1 NY.....100 lb.	2.65	2.85	2.85
.05½	.05	.05	.05	Sulfur Chloride, red, 700 lb drs wks.....lb.	.05	.05½	.05½
.04½	.03½	.03½	.03½	Yellow, 700 lb drs wks.....lb.	.03½	.04½	.04½
.08½	.08	.08	.08	Sulfur Dioxide, 150 lb cyl....lb.	.08	.08½	.08½
.19	.17	.17	.17	Extra, dry, 100 lb cyl.....lb.	.17	.19	.19
.65	.10	.65	.65	Sulfuryl Chloride, 600 lb dr...lb.	.10	.65	.65
.11½	.11	.11	.11	Stainless, 600 lb bbls....lb.	.11	.11½	.11½
.06	.05½	.05	.05	Extract, 450 lb bbls.....lb.	.05½	.06	.06
130.00	130.00	130.00	130.00	Sicily Leaves, 100 lb bg...ton	.....	130.00	130.00
72.00	72.00	80.00	72.00	Ground shipment.....ton	.....	72.00	72.00
60.00	55.00	55.00	55.00	Virginia, 150 lb bags.....ton	55.00	60.00	60.00
15.00	12.00	12.00	12.00	Talc, Crude, 100 lb bgs NY...ton	12.00	15.00	15.00
18.00	16.00	16.00	16.00	Refined, 100 lb bgs NY..ton	16.00	18.00	18.00
35.00	30.00	30.00	30.00	French, 220 lb bags NY...ton	20.00	25.00	25.00
45.00	38.00	38.00	38.00	Refined, white, bags....ton	38.00	45.00	45.00
50.00	40.00	40.00	40.00	Italian, 220 lb bags NY...ton	40.00	50.00	50.00
55.00	50.00	50.00	50.00	Refined, white, bags....ton	50.00	55.00	55.00

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Mar. 1929 $1.017

the total imports from China in 1927 and approximately 11 per cent. for last year. Total February wood oil exports from Hankow amounted to 3,316,000 pounds, of which quantity the United States received 2,756,000 pounds, with 560,000 pounds to Europe. Wood oil stocks at Hankow the end of February are estimated at approximately 5,000 short tons.

Coconut Oil — The prevailing tendency during the past month has been towards easy conditions in this market. As a result, prices are somewhat lower on Cochin and Manila. Quotations are as follows: Cochin in tanks at New York, 9c @ 9¼c lb.; Manila, barrels, New York, 9c @ 9¼c lb., and Coast tanks, 6¾c @ 7⅞c lb. There has been but little activity during the past month and what little buying there has been has been confined to the hand-to-mouth variety.

Corn Oil — Somewhat easier conditions in the grain market have led to lower prices on tanks of both the crude and refined oil. Crude oil in tanks at the mills is now at 8¾c lb., a decline of ¾c lb. since last reported. Refined oil in tanks is at 10½c lb. Barrel prices remain unchanged.

Cottonseed Oil — The general tendency during the past month has been towards somewhat lower price levels. Conditions in general have been steady but dull. Crude oil is now at 8⅞c @ 9c lb.; while PSY on spot is at 10.60c lb., with futures about 10.75c lb. Cottonseed crushed during the seven months ended with February totaled 4,230,549 tons, against 4,028,539 tons in the same period a year ago, according to figures made public by the United States Census Bureau. Receipts during the period totaled 4,858,266 tons, against 4,422,412 tons, and stocks on hand at the close of February totaled 646,849 tons, against 483,157 tons February 29, 1928.

The output of cottonseed products during the period included 1,323,254,856 pounds of crude oil, against 1,263,036,767 pounds in the same period a year ago; 1,100,475,389 pounds of refined oil, against 992,089,257 pounds.

Exports of cottonseed products for the six months ended with January 31, included 13,687,856 pounds of crude oil, against 27,665,229 pounds in the period ended with January, 1928; 4,797,334 pounds of refined oil against 4,650,018 pounds.

Linseed Oil — Although quoted prices have remained unchanged at 9.4c lb. in tanks, and 10.2 lbc., in barrels, business has been done at two points under these figures on firm bids. Demand has been rather slack and considerable competition has been noticeable among crushers.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
5.10&10	4.65&10	4.85	4.00	Tankage Ground NY.....unit	..... 4.75&10	4.75&10	4.75&10
4.80&10	3.90&10	5.25	3.75	High grade f.o.b. Chicago.unit	.....4.00&1.00	4.80&10	4.00&100
5.00&10	4.60&10	5.25	4.00	South American cif.....unit	..... 4.80&10	4.80&10	4.80&10
.05	.04½	.04½	.04½	Tapioca Flour, high grade bgs..lb.	.04½	.05	.05	.04½
.04	.03¾	.03¾	.03¾	Medium grade, bags.....lb.	.03¾	.04	.04	.03¾
.27	.26	.26	.26	Tar Acid Oil, 15%,drums....gal.	.26	.27	.27	.26
.30	.29	.29	.29	25% drums.....gal.	.29	.30	.30	.29
.08	.07	.07	.07	Coke Oven, tanks wks.....lb.	.07	.08	.08	.07
13.50	13.50	16.00	13.50	Kiln Burnt, bbl.....bbl.	.....	13.50	13.50	13.50
15.00	13.50	18.50	13.50	Retort, bbls.....bbl.	13.50	15.00	15.00	13.50
1.75	1.15	1.15	1.15	Terra Alba Amer. No. 1, bgs or bbls mills.....100 lb.	1.15	1.75	1.75	1.15
2.00	1.50	1.50	1.50	No. 2 bags or bbls...100 lb.	1.50	2.00	2.00	1.50
.02½	.02	2.00	2.00	Imported bags.....100 lb.	.02	.02½	.02½	.02
.....	.....	.....	.....	Tetrachlorethane, 50 gal dr...lb	.09	.09½	.09½	.09
.20	.20	.20	.20	Tetralene, 50 gal drs wks.....lb	.....	.20	.20	.20
.24	.22	.22	.22	Thiocarbanilid, 170 lb bbl....lb	.22	.24	.24	.22
.17½	.14½	.20½	.17½	Tin Bichloride, 50% soln, 100 lb bbls wks.....lb.	.....	.14½	.14½	.14½
.41½	.36½	.48	.41½	Crystals, 500 lb bbls wks...lb.	.....	.36½	.36½	.36½
.58	.48	.71½	.58	Metal Straits NY.....lb.	.....	.48	.48	.48
.75	.53	.75	.70	Oxide, 300 lb bbls wks.....lb.	.....	.56	.56	.53
.35½	.30½	.48	.35½	Tetrachloride, 100 lb drs wks. .....lb.	.....	.30½	.30½	.30½
.40	.40	.40	.40	Titanium Oxide200 lb bbl....lb.	.....	.40	.40	.40
.14	.13½	.13½	.13½	Pigment, b,bls wks.....lb.	.13½	.14	.14	.13½
.45	.40	.40	.40	Toluene, 110 gal drs wks.....lb.	.....	.45	.45	.45
.45	.35	.35	.35	8000 gal tank cars wks.....lb.	.....	.40	.40	.40
.94	.90	.90	.90	Toluidine, 350 lb bbls.....lb.	.90	.94	.94	.90
.32	.31	.31	.31	Mixed, 900 lb drs wks.....lb.	.31	.32	.32	.31
.90	.85	.85	.85	Toner Lithol, red, bbls.....lb.	.85	.90	.90	.85
.80	.70	.75	.75	Para, red, bbls.....lb.	.70	.75	.75	.70
1.80	1.70	1.75	1.75	Toluidine.....lb.	1.50	1.55	1.55	1.50
3.90	3.60	3.60	3.60	Triacetin, 50 gal drs wks.....lb.	3.60	3.90	3.90	3.60
.....	.....	.....	.....	Trichlorethylene, 50 gal dr...lb.	.10	.10½		
.....	.....	.....	.....	Triethanolamine, 50 gal drs...lb.	.55	.60	.60	.55
.50	.36	.36	.36	Tricresyl Phosphate, drs.....lb.	.33	.45	.45	.33
.73	.69	.70	.69	Triphenylguanidine.....lb.	.58	.60	.70	.58
.75	.70	.70	.70	Phosphate, drums.....lb.	.70	.75	.75	.70
3.00	2.50	2.50	2.50	Tripoli, 500 lb bbls.....100 lb.	1.75	2.00	2.00	1.75
.66½	.50½	.86	.53½	Turpentine Spirits, bbls.....gal.	.59½	.65	.65	.57½
.59	.46	.76	.46	Wood Steam dist. bbls....gal.	.56	.57	.57	.55
.20	.18	.18	.18	Urea, pure, 112 lb cases.....lb.	.20	.30	.30	.20
76.00	55.00	70.00	66.00	Valonia Beard, 42%, tannin bags.....ton	.....	50.00	55.00	50.00
55.00	58.00	49.50	39.00	Cups, 30-31% tannin.....ton	.....	35.00	35.00	35.00
64.00	45.00	68.00	43.00	Mixture, bark, bags.....ton	.....	40.00	43.00	40.00
2.10	1.75	1.95	1.55	Vermillion, English, kegs....lb..	2.00	2.05	2.05	2.00
.....	.....	.....	.....	Vinyl Chloride, 16 lb cyl.....lb.	.....	1.00	1.00	1.00
76.00	49.75	59.00	49.50	Wattle Bark, bags.....ton	.....	46.00	49.75	44.50
.06½	.05½	.05½	.05½	Extract 55%, double bags ex-dock.....lb.	.....	.06½	.06½	.06½
1.25	1.25	1.25	1.25	Whiting, 200 lb bags, c-1 wks .....100 lb.	.....	1.25	1.25	1.25
13.00	13.00	13.00	13.00	Alba, bags c-1 NY.....ton	.....	13.00	13.00	13.00
1.35	1.35	1.35	1.35	Gilders, bags c-1 NY...100 lb.	.....	1.35	1.35	1.35

Zinc

.05½	5.85	.06½	.06½	Zinc Ammonium Chloride powd., 400 lb bbls.....lb.	5.25	5.75	5.75	5.25
.10	.09½	.09½	.09½	Carbonate Tech, bbls NY..lb.	.10½	.11	.11	.10½
.06	.06	.06	.06	Chloride Fused, 600 lb drs. wks.....lb.	.05½	.06	.06	.05½
.06½	.06½	.06½	.06½	Gran., 500 lb bbls wks.....lb.	.06½	.06½	.06½	.06½
3.00	3.00	3.00	3.00	Soln 50%, tanks wks...100 lb.	.....	3.00	3.00	3.00
.41	.40	.40	.40	Cyanide, 100 lb drums.....lb.	.40	.41	.41	.40
				Dithiofuroate, 100 lb dr....lb.	.....	1.00	1.00	1.00
.09	.09	.09	.09	Dust, 500 lb bbls c-1 wks..lb.	.08½	08½	.08½	.08½
6.40	6.07½	7.35	6.40	Metal, high grade slabs c-1 NY.....100 lb.	.....	6.45	6.45	6.45½
.07½	.07½	.07½	.07½	Oxide, American bags wks..lb.	.07½	.07½	.07½	.07
.12½	.10½	.10½	.10½	French, 300 lb bbls wks...lb.	.09½	.11½	.11½	.09½
.....	.....	.....	.....	Perborate, 100 lb drs.....lb.	.....	1.25	1.25	1.25
.....	.....	.....	.....	Peroxide, 100 lb drs.....lb.	.....	1.25	1.25	1.25
.....	.....	.....	.....	Stearate, 50 lb bbls.....lb.	.25	.26	.26	.25
.03½	.03½	.03½	.03	Sulfate, 400 bbl wks.....lb.	.03½	.03½	.03½	.03½
.32	.30	.30	.30	Sulfide, 500 lb bbls.....lb.	.30	.32	.32	.30
.30	.29	.29	.29	Sulfocarbolate, 100 lb keg..lb.	.29	.30	.30	.29
.32	.32	.38	.32	Xylene, 10 deg tanks wks....lb.	.....	.33	.33	.33
.32	.30	.36	.30	Commercial, tanks wks....lb.	.30	.32	.32	.30
.38	.38	.35	.35	Xylidine, crude.....lb.	.....	.38	.38	.38
.03	.02½	.02½	.02½	Zirconium Oxide, Nat. kegs...lb.	.02½	.03	.03	.02½
.50	.45	.45	.45	Pure kegs.....lb.	.45	.50	.50	.45
.10	.08	.08½	.08	Semi-refined kegs.....lb.	.08	.10	.10	.08

Oils and Fats

.14½	.13	.14	.13	Castor, No. 1, 400 lb bbls.....lb.	.13	.13½	.13½	.13
.14	.12½	.14	.12½	No. 3, 400 lb bbls.....lb.	.12½	.13	.13	.12½
.17	.14	.18	.17	Blown, 400 lb bbls.....lb.	.14	.15	.15	.14
.17	.14½	.31	.13½	China Wood, bbls spot NY...lb.	.14½	.14½	.15½	.14½
.14½	.14½	.18	.12½	Tanks, spot NY.....lb.	.....	Nom.	Nom.	.....
.14½	.12½	.....	.....	Coast tanks, Apr.....lb.	.13½	.13½	.14½	.12½
.11½	.10½	.12	.12	Cocoanut, edible, bbls NY....lb.	.....	.10½	.10½	.10½
.10	.09½	.09½	.09	Ceylon, 375 lb bbls NY....lb.	.09	.09½	.09½	.09
.09	.08½	.08½	.08	8000 gal tanks NY.....lb.	.08½	.08½	.08½	.08½
.10½	.09½	.10½	.09½	Cochin, 375 lb bbls NY....lb.	.....	.10	.10	.10
.09½	.08½	.10	.08½	Tanks NY.....lb.	.09	.09½	.09½	.09
.10	.08½	.09½	.08½	Manila, bbls NY.....lb.	.09	.09½	.09½	.09
.08½	.08	.08½	.08½	Tanks NY.....lb.	.08½	.08½	.08½	.08½
.08½	.07½	.08½	.08	Tanks, Pacific Coast.....lb.	.07½	.07½	.08	.07½

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1829 $1.047 - Mar. 1929 $1.017

Perilla Oil — Has been in somewhat better supply and consequently prices are not so high as they have been. Tanks at the Coast are now at 13¼c lb., a decline of ¼c lb. since last reported. Barrels on spot are also lower having declined 2c lb. to 18c lb.

Rapeseed Oil — Both English and Japanese are somewhat higher this month due to the good demand which has tended to decrease stocks. English is now at 88c @ 90c gal., while Japanese is at 86c @ 88c gal.

Sardine Oil — Is in much better supply, and as a result has declined 5c gal. since last reported, being at 45c gal.

Soy Bean Oil — Considerable material has become available at the Coast and as a result the tank price both at that point and in New York are lower, the former now being at 9½c lb. and the latter at 10¼c lb. Barrel prices remain unchanged.

Stearic Acid — Continues very active and in exceedingly good demand with double pressed distilled at 16c @ 16½c lb., double pressed saponified at 16½c @ 17c lb., and triple pressed distilled at 18½c @ 19c lb.

Tallow — In common with other members of the animal group, tallow has declined considerably in price since last reported. Extra is now at 8⅝c @ 8¾c lb., a decline of ⅝c lb. Edible is also lower at 9½c @ 9¾c lb.

Tallow Oil — Has declined ¼c lb. since last reported and is now quoted at 10¾c lb. in tanks and 11¾c lb. in barrels.

Whale Oil — The principal purchasers of Norwegian whale oil are the large margarine manufacturers, Jürgens and Van den Bergh, sometimes called the margarine trust, who, together with Lever Brothers, the Norwegian company De-No-Fa, and the American Procter Gamble Co., have formed a buying-ring, states the "Anglo-Norwegian Trade Journal." Outside this ring there has hitherto been only one important buyer, the Dutch firm of Hartog. It is now reported from London that this firm has been acquired by Jürgens, and it is estimated that 90 per cent. of whale oil buyers are therefore now members of the buying pool. This development will probably hasten the realisation of the plan for the formation of a joint sales organisation for Norwegian and foreign whaling companies, which has long been in contemplation. A meeting of those interested will probably be called in Norway in the near future. The greater part of this season's whale oil production has already been sold in advance at prices which are believed to be between £30 and £31 per ton for the best quality.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Cod, Newfoundland, 50 gal bbls			
.69	.63	.66	.63	gal.	.63	.64	.63
.63	.60	.59	.59	Tanks NY lb.	.....	.60	.60	.60
				Cod Liver see Chemicals			
.06¼	.05¼	.06	.06	Copra, bags lb.	.....	.05	.05¼	.05
.11	.10	.11	.07	Corn, crude, bbls NY lb.	.....	10¾	.10¾	.10½
.10	.08⅜	.09¼	.07	Tanks, mills lb.	.....	.08¼	.09¼	.08⅝
.12½	.11½	.14	.10½	Refined, 375 lb bbls NY lb.	.....	.11¼	.11¼	.11½
.11½	.10½	.12	.11	Tanks lb.	.....	.10½	.11	.10½
.09¼	.07¾	.09½	.06½	Cottonseed, crude, mill lb.	.08⅞	.09	.09	.08⅞
10.65	.09½	.11¼	.08 1/5	PSY 100 lb bbls spot lb.	.....	.1060	.1075	10.45
10.75	.09½	.....	.....	May—July lb.	.....	.1075	.1080	10.60
				Degras, American, 50 gal bbls			
.05	.04½	.04½	.04½	NY lb.	.04½	.05	.05	.04½
.05⅛	.04½	.04⅛	do	English, brown, bbls NY lb.	.....	.05⅛	.05⅛	.05⅛
.05¼	.05¼	.05¼	.05¼	Light, bbls NY lb.	.....	.05¼	.05¼	.05¼
				Greases			
.08½	.07	.07½	.06	Greases, Brown lb.	.....	.08	.08½	.08
.08½	.07	.08	.06½	Yellow lb.	.....	.08¼	.08½	.08¼
.11	.09½	.10⅛	.08½	White, choice bbls NY lb.	.....	.08½	.11¼	.08½
.42½	.40	.....	.....	Herring, Coast, Tanks gal.	.....	Nom.		
Nom.	.09½	.09½	.09	Horse, bbls lb.	.09½	Nom.	Nom.	.....
.16½	.15½	.16¾	.14¾	Lard Oil, edible, prime lb.	.....	.15¾	.15¾	.15½
.13½	.12	.13¾	.10¾	Extra, bbls lb.	.....	.13½	.13½	.13¼
.13	.11	.12½	.10½	Extra No. 1, bbls lb.	.....	13¼	.13¼	.13
10.8	10.0	.11 4/5	.10 2/5	Linseed, Raw, five bbl lots lb.	.....	.106	.106	1.05
10.4	9.6	.11 9/10	.09 6/10	Bbls c-l spot lb.	.....	.102	.102	1.01
9.6	8.8	.10½	.09	Tanks lb.	.....	.094	.094	.093
.09¾	.09¾	.09¾	.09¾	Lumbang, Coast lb.	.....	.09¾	.09¾	.09¾
.48	.40	.47½	.44	Menhaden Tanks, Baltimore gal.	.....	.52	.52	.52
.09	.09	.90	.10	Blown, bbls NY lb.	.....	.09	.09	.09
.70	.67	.70	.67	Extra, bleached, bbls NY gal.	.....	.70	.70	.70
.64	.63	.66	.63	Ligh, pressed, bbls NY gal.	.63	.64	.64	.63
.67	.66	.66	.69	Yellow, pressed, bbls NY gal.	.66	67	.67	.66
				Mineral Oil, white, 50 gal bbls				
.60	.40	.....	.....	gal.	.40	.60	.60	.40
1.00	.95	.....	.....	Russian, gal gal.	.95	1.00	1.00	.95
.19	.18½	.18¾	.14½	Neatsfoot, CT, 20° bbls NY lb.	.....	.18¾	.19	.18¾
.13½	.12	.13¼	.10½	Extra, bbls NY lb.	.....	.13½	.13½	.13¼
.16½	.15½	.16¾	.12½	Pure, bbls NY lb.	.....	.15	.15½	.15
.17⅜	.11¾	.18½	.10	Oleo, No. 1, bbls NY lb.	.....	.11½	.11½	.11½
.15½	.11	.17	.08¾	No. 2, bbls NY lb.	.....	.11	.11¼	.11
.14	.10	.14	.08½	No. 3, bbls NY lb.	.....	.10½	.10½	.10¼
1.40	1.18	1.75	1.40	Olive, denatured, bbls NY gal.	1.25	1.30	1.30	1.25
2.00	1.75	2.00	2.45	Edible, bbls NY gal.	1.95	2.00	2.00	1.95
.11	.09⅜	.10¼	.08¾	Foots, bbls NY lb.	.10½	.11	.11½	.10¼
.09½	.08½	.09½	.09	Palm, Kernel, Casks lb.	.08½	.09	.09	.08¾
.09¼	.07½	.08¾	.07½	Lagos, 1500 lb casks lb.	.....	.09	.09	.09
.08⅜	.07	.08¼	.07½	Niger, Casks lb.	.....	.08¾	.08¾	.08½
.12½	.12	.14½	.12	Peanut, crude, bbls NY lb.	.....	Nom.	Nom.	.....
.17	.14½	.15½	.14½	Refined, bbls NY lb.	.14½	.15	.15	.14½
.21	.13	.16½	.12½	Perilla, bbls NY lb.	.....	.18	.20	.18
.15½	.10½	.14½	.10	Tanks, Coast lb.	.....	.13½	.14½	.13¼
1.75	1.70	1.70	1.70	Poppyseed, bbls NY gal.	1.70	1.75	1.75	1.70
1.06	1.01	1.05	1.00	Rapeseed, blown, bbls NY gal.	1.04	1.04	1.04	1.04
.92	.83	.90	.82	English, drms. NY gal.	.88	.90	.90	.85
.90	.81	.85	.76	Japanese, drms. NY gal.	.86	.88	.88	.84
.10⅜	.09½	.10	.09	Red, Distilled, bbls lb.	.11½	.11⅜	.11⅜	.10½
.09½	.08	.09½	.08½	Tanks lb.	.....	.10½	.10½	.09½
.5C	.42	.50	.50	Salmon, Coast, 8000 gal tks. gal.	.42	.44	.44	.42
.50	.41	.47	.43	Sardine, Pacific Coast tks gal.	.....	.45	.51	.45
.13½	.12	.13	.11½	Sesame, edible, yellow, dos lb.	.11½	.12	.12	.11½
.15	.12½	.14	.14	White, dos lb.	.12½	.12½	.12½	.12¼
.40	.40¼	.40	.40	Sod, bbls NY gal.	.....	.40	.40	.40
.....	.....	.09⅜	.09½	Soy Bean, crude				
.09½	.09	.....	.....	Pacific Coast, tanks lb.	.....	.09½	.10	.09½
.12½	.12	.12½	.10⅜	Soy Bean, crude, bbls NY lb.	.....	.12½	.12½	.12½
.10⅜	.10½	.11	.10½	Tanks NY lb.	.....	.10¼	.10½	.10½
.13¼	.13¼	.13	.12	Refined, bbls NY lb.	.13½	.13½	.13½	.13½
				Sperm, 38° CT, bleached, bbls				
.85	.84	.85	.84	NY gal.	.84	.85	.85	.84
.80	.79	.82	.79	45° CT, bleached, bbls NY gal.	.79	.80	.80	.79
.18½	.11	.13½	.11½	Stearic Acid, double pressed dist bags lb.	.16	.16½	.18½	.16
				Double pressed saponified bags				
.19	.11½	.14	.11½	lb.	.16½	.17	.19	.16½
.20½	.13½	.15½	.13¼	Triple, pressed dist bags lb	.18½	.19	20½	.18½
.12½	.09½	.13	.08⅜	Stearine, Oleo, bbls lb.	.11⅞	.12	.12	.11¼
.09½	.08¼	.09	.07½	Tallow City, extra loose lb.	.08¼	.08¼	.08¼	.08¼
.10¼	.09¼	.11	.08¼	Edible, tierces lb.	.09½	.09½	.10½	.09½
.12½	.11½	.10¾	.08½	Tallow Oil, Bbls, c-1 NY lb.	.....	.11½	.12	.11⅜
.11½	.10½	.12½	.10	Acidless, tanks NY lb.	.....	.10¾	.11	.10¼
Nom.	.08	.08½	.07½	Vegetable, Coast mats lb.	.08	Nom.	Nom.	.08
.11	.....	.11	.11	Turkey Red, single bbls lb.	.11	.12	.12	.11
.16	.14	.14	.14	Double, bbls lb.	.14	.16	.16	.14
				Whale, bleached winter, bbls				
.80	.78	.78	.78	NY gal.	.78	.80	.80	.78
.82	.80	.80	.80	Extra, bleached, bbls NY gal.	.80	.82	.82	.80
78	.76	.76	.76	Nat. winter, bbls NY gal.	.76	.78	.78	.76

Local Reports *from our Correspondents at the Principal Consuming Centers of Industrial Chemicals*

California

Illinois

BOSTON

Market conditions show an improvement over the previous month, with more than a fair volume of buying. In general, prices are very firm, with some commodities advancing. Among these items blue vitriol is the outstanding one, with rapid advances due to the high price of copper and the approaching agricultural season's demand. Collections generally are very good.

KANSAS CITY

Business is holding up in the chemical line in a fairly good manner. Paint manufacturers are beginning to get active and entering the market for raw materials. Copper sulfate is the principle item creating some excitement in the market at this time due to its severe advance. Cod liver oil is beginning to move in good volume and lower prices are increasing its use. Trade in general reports greater volume during March 1929 than in 1928. Seasonable items like sodium fluoride and sassafras bark and insecticides are beginning to be active. Building trade somewhat upset by demands for 5-day week for skilled labor which is proving somewhat troublesome.

ST. LOUIS

Generally speaking business during 1929 has not been up to expectations. On account of the unsettled condition of the money market, large buyers have held off placing future contracts and have bought only supplies for their immediate needs. Linseed oil and turpentine have been moving in fair quantities and the markets for these items, which during the first three weeks of the month, were advancing, showed signs of receding. Rosin sales did not keep pace with linseed oil and turpentine. With the metal markets generally advancing, the various salts of the metals reacted in sympathy; blue vitriol advanced one cent per pound and lead oxides advanced ½c per pound. Because of flood conditions throughout the Mississippi Valley during the latter part of March, many shipments were held up. As the waters receded, there was a strong demand for chloride of lime and other disinfectants. Agricultural chemicals have started to move in appreciable quantities and the warm weather presages larger demand for these commodities in the near future. Collections have been very poor.

Massachusetts

Michigan

Missouri

Local Reports

from our Correspondents at the Principal Consuming Centers of Industrial Chemicals

Missouri---(cont.)

New Jersey

New York

NEWARK

The last month has shown a healthy tone in mineral acids and industrial chemicals and nearly everyone seems confident that good business conditions will continue for sometime at least. Collections are not up to what they should be. This may be brought about by the larger volume of business flowing without sufficient capital to take care of it on the part of certain concerns. Prices are very steady; there are practically no declines, although for the most part there is plenty of stock available with few exceptions, one of which is toluol. A scarcity of this product is likely to force higher prices if the demand continues to increase, as the supply is limited. The unemployment situation is not at all acute, skilled labor particularly being in demand. The color companies are active and there is a decided improvement among a number of the textile manufacturers who have been operating on a low production basis for a long period of time.

CLEVELAND

General business in the Cleveland territory is better. The steel business, which is the barometer in this territory, is going along at a good rate with many of the consumers of steel contracting for the second quarter at slightly higher prices. The paint and varnish industry is also moving well. Some of the manufacturers are working over time Buying of chinawood oil and linseed oil has been rather spotty. The general feeling here is one of optimism.

PHILADELPHIA

Chemical trade conditions in Philadelphia and adjacent territory, have been satisfactory during the month. There have been good days and bad in the month, but on the average it has been fairly satisfactory. Naphthalene is extremely active and in good demand. Most of the drug houses report business in general in good condition; the paint and varnish industries appear to be busy. Textile trades also seem to have more business; while the leather trades seem to be just going along, although some say that the business is a little bit better. Collections also, are fair.

Ohio

Rhode Island

Index To Advertisers

"WE"—Editorially Speaking

Too—early Spring is bothering the fertilizer and insecticide manufacturers, which emphasizes what is after all the single undeterminable factor in the market for these stable commodities. Over a period of years the consumption of both fertilizers and insecticides, while it has varied from season to season, there is possibly less actual variation than such supposedly staple industries as the manufacture of automobiles, shoes and toilet preparations—nor is this surprising. For the use of these chemicals is becoming increasingly necessary for the production of adequate food supplies. Just when the Farmer will plant or spray, depends, however, upon the vagaries of the season. If the manufacturers in these fields would once thoroughly convince themselves of the soundness of this fact—which statistics amply support—there would be much less wild scramble for business, much less price-cutting, much less marketing, disorganizing, which in the present has turned topsy-turvy this great branch of chemical manufacture.

A glance through our pages this month shows that their contents are attuned to the vernal season. Much has been said and written concerning the power and effect of this season of the year in changing the appearance of the earth's surface, or at least that portion of it with which we of the temperate zones come in contact. But in succumbing to the magic of Springtime, we are prone to forget that this season serves a very utilitarian purpose as well. The earth brings forth potatoes as well as pussywillows, cabbages as well as crocuses. And man does what he can to aid the process with his fertilizers, his copper sulfate and his mercury salts. All of which is a rather long-winded way of saying that we rather run to fertilizers and insecticides in this issue, which we rather feel is as it should be at this time of the year.

In "Fertilizers of the Future", Dr. Landis has presented a complete picture of the history of fertilizer development, and on this basis points out what we may expect from future developments. He points out the inevitableness of the drift away from the older organics of animal or vegetable origin to the newer synthetic salts mostly of inorganic nature. Even these latter will undergo material changes and be replaced by greatly improved conbinations as the science of compounding improves along with our knowledge of plant requirements and soil deficiencies.

The Soviet Government of Russia has set about an elaborate program for the creation of a chemical industry in that country. The progress which has been made thus far is truly remarkable, as indicated in the article on Russia's chemical industry by S. S. Shipman of the Amtorg Trading Co. But what has been done so far is but a small part of the entire project which he describes elsewhere in these pages.

COMING FEATURES

THE CHEMICAL CAR

The automobile is translated in terms of chemicals by L. B. Case of the General Motors Research Laboratories.

RETROSPECT AND PROSPECT IN THE NITROGEN INDUSTRY

Chaplin Tyler of Lazote, Inc., presents a thorough resume of the entire nitrogen situation with all its ramifications and future possibilities.

NOW IT CAN BE TOLD

In which a third chapter will be added to this series of chemical reminiscences which has already included Dr. Jones' story of the Solvay enterprises and C. P. Seaverns' story of early days in Boston.

Aside from a certain timeliness from a seasonal point of view, copper sulfate has a particular news value all its own due to the price advances it has made in recent weeks, following the spectacular upward climb of the metal market. Out of the experiences of his long years of familiarity at close range with the copper sulfate market, Mr. Hitchcock tells of the changing spheres of usefulness of an old friend, blue vitriol. Another old friend, calomel, also has come forward in a new role, that of a soil insecticide. Dr. Glasgow describes in his article the experiments which have been conducted and the results which have thus far been obtained in the evolution of a new soil insecticide, possessing considerable fungicidal value in checking seedbed diseases.

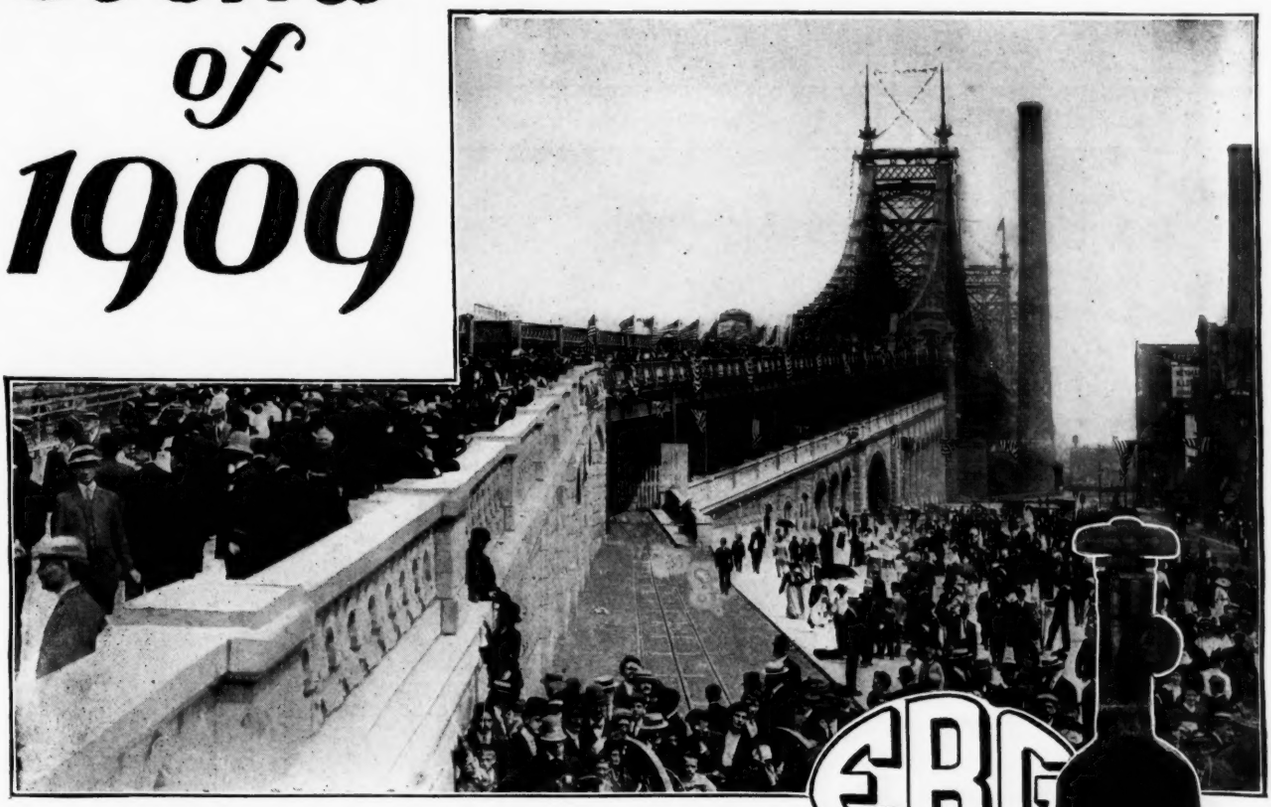
We are apt to have a life subscriber. The president of one of the important chemical enterprises of New York State has written to ask us a price on a copy of CHEMICAL MARKETS for his desk and his home every month during the rest of his life. Upon consultation with an insurance actuary, we have quoted him $48.62.

Speaking of endowments, our Washington Gossip tells us that there is a quiet movement on foot to raise a fund to maintain a perpetual inventory with proper allowance for obsolescence on the gulf prize won by Mr. Concannon at the Naval Stores convention.

Dr. Thomas K. Urdahl is well known as the author of a number of monographs and articles on economic subjects. He has been a professor of economics, politics and commerce since 1901, except for those years when he served as an examiner of the Federal Trade Commission and later as senior examiner of the Emergency Fleet Corporation. This article is the first of a series on the importance of economic research. The second installment which will follow soon will cover the work which is being done along these lines in the chemical industry, together with a more detailed outline of a piece of work on mercantile research.

Events of 1909

Over 20 Years Ago E B G Pioneered in the Manufacture of Liquid Chlorine



Opening of the Queensboro Bridge

The first pound of Liquid Chlorine produced in the U. S. A. 1907

THE year 1909 was marked by events which were destined to have an important influence in later years.

Two of these events had an immediate bearing on business and industry. The Queensboro Bridge, opened that year to traffic between New York City and populous Long Island, vastly facilitated communication. The first practical production of Liquid Chlorine by E B G enabled various industries to place bleaching on a better and more economical basis.

In the twenty years that have elapsed, the work of E B G has continuously displayed the pioneer spirit. The quality of this Liquid Chlorine has been maintained at the highest point. Cooperation of a nature vital to the utmost profit from the use of Liquid Chlorine is an integral part of the E B G policy. E B G can serve *you* to your complete satisfaction.

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